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ROADS STREETS

HIGHWAYS BRIDGES
AIRFIELDS
HEAVY CONSTRUCTION

SEPTEMBER 1953

Gillette Publishing Co., 22 W. Maple St., Chicago, Ill.
Form 3547 Requested

Acceptance Authorized Under Sec. 34.64 P. L. & R.

To keep its Rex 5½-yard Adjusta-Wate Moto-Mixer on the job—day in, day out—**CHAIN BELT COMPANY** mounts vital parts on Timken tapered roller bearings.

How TIMKEN® bearings help a drum keep perfect time

USERS can forget about time-wasting bearing breakdowns with this Rex 5½-yard Adjusta-Wate Moto-Mixer.

Why? It's equipped with Timken® tapered roller bearings at five vital points—drum rollers, front main roller, drive shaft, secondary shaft and clutch drums.

Timken bearings' tapered construction takes all the drum's radial, thrust and combination loads. Line contact between rollers and races adds extra load-carrying capacity for even the heaviest drum loads. In heavy-duty applications like this, Timken bearings provide maximum bearing life with minimum maintenance.

Other Timken bearing advantages: moving parts are held in positive alignment, housings and shafts held concentric, closures made more effective. Lubrication and maintenance costs are cut.

To get all these Timken bearing advantages in the machinery you build or buy, make sure the trade-mark "Timken" is stamped on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

TIMKEN

TAPERED ROLLER BEARINGS

NOT JUST A BALL ○ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭ BEARING TAKES RADIAL ▯ AND THRUST ▯ LOADS OR ANY COMBINATION

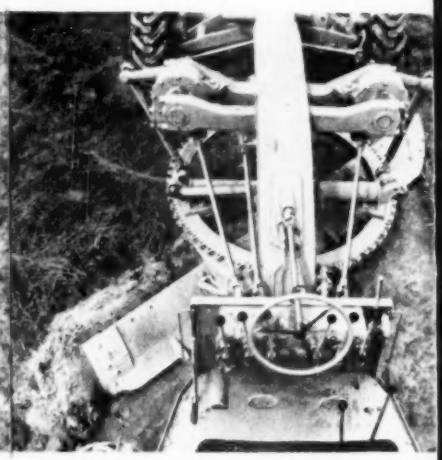
ALLIS-CHALMERS INVITES YOU TO . . .

Look at Your Grader Jobs THROUGH THE EYES OF AN AD-40 OPERATOR . . .

GRADING — Look at that single member frame — it really lets you see what you're doing . . . means efficient grading on *any* job.

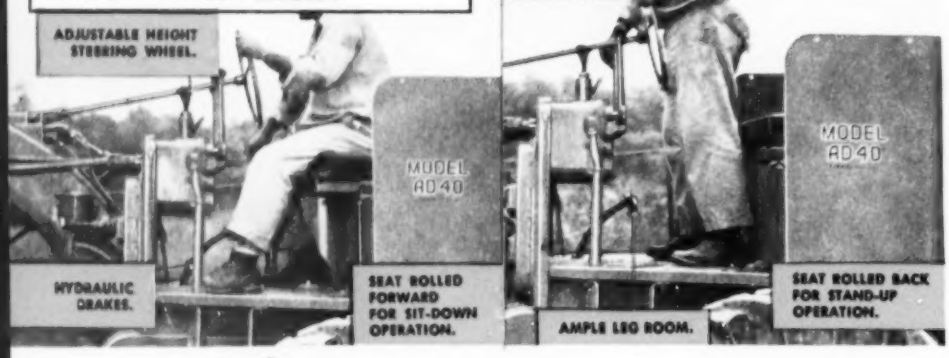
SLOPING — Look how much better you see . . . how much steadier your blade is with small control rods leading out to lift cases located directly over the circle.

DITCHING — Look at the low control panel. It gives you a clear view of the blade . . . helps insure a clean, smooth ditch.



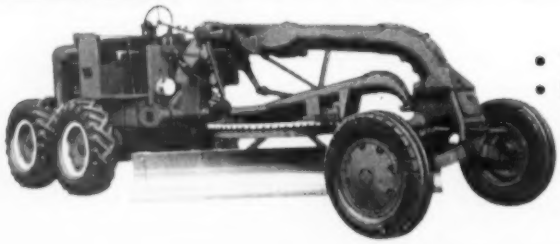
SOD STRIPPING — Look at the tapered corners on this clean, wide platform . . . how they give unequalled view of heel of ROLL-AWAY moldboard.

In addition to letting you see better, the AD-40 offers feather-touch hydraulic power steering, hydraulic brakes . . . and true comfort for any size operator, sitting or standing. **LOOK!**



Yes the big, new AD-40 is designed for today's jobs and today's operators . . . brings new standards of performance to all users of motor graders . . . handles all grading jobs faster, better, easier. You owe it to your operators . . . and yourself to ask your nearby Allis-Chalmers dealer now for a demonstration and *see for yourself*.

ROLL-AWAY is an Allis-Chalmers trademark.



- 104 bhp. • Six speeds forward, three reverse
- 23,000 lb. (with optional calcium chloride solution in rear tires — 24,800 lb.).

ALLIS-CHALMERS
TRACTOR DIVISION—MILWAUKEE 1, U. S. A.

Two Men Can Easily Handle 14-ft Sections of Sheet Steel Culvert

You don't need special lifting equipment to unload and place long sections of galvanized-sheet-steel culvert pipe.

Take the 18-in.-diameter pipe pictured above. It is 14 ft long and it weighs 214 lbs. Two men can unload and place it in a trench in a few minutes, without equipment.

Large-diameter galvanized-steel pipe weighs only a fraction as much as pipe made of other materials. It comes in longer sections that are easier to ship.

NUMBER OF FIELD JOINTS REDUCED

The longer sections require fewer field joints, a feature that saves costly man-hours. Three 14-ft sections, for example, can be assembled into a 42-ft culvert by means of two field joints.

Bethlehem does not fabricate culvert or drainage pipe, but does manufacture the Beth-Cu-Loy galvanized-corrugated and flat steel stock used by pipe fabricators. This copper-bearing steel more than meets the specifications set by the American Association of State Highway Officials. It carries a 2-oz zinc coating, as determined by the triple spot test. It comes flat or corrugated, in gages from 8 to 16, inclusive; in lengths 60 in. to 156 in.

Any Bethlehem sales office will gladly furnish detailed information on Beth-Cu-Loy, and the names of fabricators who use it. Write or phone.

BETHLEHEM STEEL COMPANY
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On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETH-CU-LOY *GALVANIZED* CULVERT SHEETS

ROADS AND STREETS

SEPTEMBER, 1953 • VOL. 96 • No. 9

Roads and Streets represents 61 years of continuous publishing in the highway field; combined with Engineering & Contracting and Good Roads Magazines, established in 1892

HAROLD J. McKEEVER, Editor-in-Chief
C. T. MURRAY, Managing Editor

COL. V. J. BROWN, Vice Pres. and Coordinator
J. C. BLACK, Associate Editor

A magazine devoted to the design, construction, maintenance and operation of highways, streets, bridges, bridge foundations and grade separations, and to the construction and maintenance of airports.

Coming Articles

Moving Million Yards Weekly on W. Va. Turnpike

Coming in October is a special report on the grading of the 88-mile West Virginia Turnpike. Individual contractors are running as high as 135,000 cu. yd. a week on this job, which entails 30,000,000 cu. yd. of unclassified excavation—60 per cent rock or shale requiring blasting—plus another 10,000,000 cu. yd. of roadway borrow and miscellaneous excavation. Testing ground for 3½ to 5½-yd shovels, big rotary drills, oversize wagons.

Digest of Construction and Engineering Articles

Beginning next month, a new Roads & Streets feature—useful data for the busy reader, briefed down from current technical and semi-technical literature.

Minnesota Develops Better Joint Renovation Technique

New mechanized methods of cleaning and resealing concrete pavement joints, designed to make joints do for years and add to pavement longevity, devised by the Minnesota maintenance engineers. Over $2,000,000 in contracts awarded in past 3 years.

Also . . .

With Morrison-Knudsen Company, Inc., on Alaska road reconstruction . . . Pile driving formulas reviewed, compared and appraised . . . More articles on municipal snow removal and ice control methods . . . How weather consultants aid public works officials . . . Relocating Mohawk River and barge canal to build New York Thruway section . . . New York state adds truck lanes, cuts down summits, for improved traffic safety and capacity . . . How contractor got uniform aggregates from stratified pit . . . Autumn meeting reports.

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GILLETTE PUBLISHING COMPANY

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If you STALL—profits STOP!

When a tire fails to *grip*, you lose time and money. When a tire "dies" on the job, men and equipment stand idle, profits disappear.

That's why the *only* tires you can afford are the best *workers*—the ones that can take on tire-killing jobs, day in, day out—and keep going!

Only worlds of experience can build such tires—*and Goodyear has it*—for Goodyear has built more tires for more uses than anyone else on earth!

This enormous, unequaled experience gives Goodyear a *practical* approach to your tire problems that means better pull and longer wear. So why not protect *your* profits with the tires that *proved* they pay their own way, day after day, on the toughest jobs on earth?

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The **SURE-GRIP** for traction

The **HARD ROCK LUG** for tire-killing work

The **ALL-WEATHER** for flotation

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Sure-Grip, All-Weather—T. M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

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MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND

We think you'll like "THE GREATEST STORY EVER TOLD"—every Sunday—ABC Radio Network—THE GOODYEAR TELEVISION PLAYHOUSE—every other Sunday—NBC TV Network

BETTER LOADING

"The job called for more tonnage than we'd ever moved before so we picked the EIMCO 104 and it did everything you said . . ." Yes! when you need fast efficient loading you can't beat an EIMCO. In rock, clay, sand, gravel or any combination of these materials the 104 will dig and load between 350 and 450 tons per hour — given sufficient haulage equipment.

The EIMCO does not have to turn to discharge. This feature saves wear and tear on tracks and rollers; saves time in loading, makes possible loading in narrow cuts and road cleanup jobs without interfering with traffic.

EIMCO's are easier on trucks too — you can control the bucket anywhere in its travel — stop it, hold it, "dribble" the load into small trucks.

For small jobs there are other EIMCO models, seven sizes to choose from to fit every size loading job. When you want loading equipment get an EIMCO — write for information on the machine for your job now.

EIMCO A476

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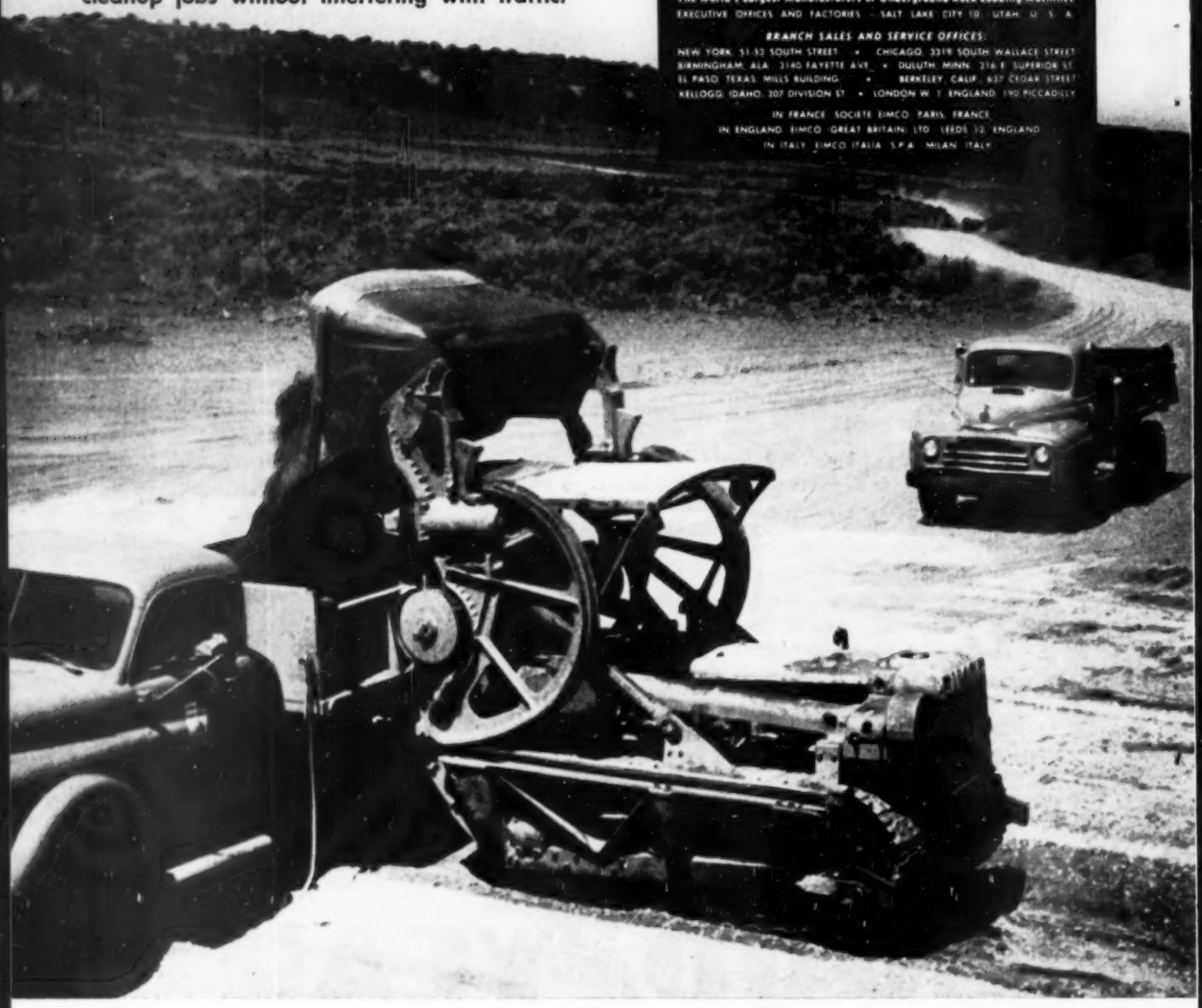


Major earthmovers on this 1,800,000 cu. yd. contract at Des Moines Municipal Airport are high-speed, high-capacity Caterpillar DW20 Tractors with No. 20 Scrapers. John P. Abramson Construction Co., Des Moines, Iowa, assembled a line-up of big yellow equipment including 'dozers, DW10s and motor graders to build the 2,800-ft. extension on the northwest runway. It calls for two fills—one of 51 ft., the other of 35 ft. Superintendent Jay A. Scott reports: "Caterpillar equipment is the most standard there is—down time is small with it. We get very good service from our dealer."

Jobs like this need big producers that stay in there working—and you're looking at one in the DW20. It has a travel speed of 26.6 m.p.h., a capacity of 20 cu. yd. heaped and 15 struck, and plenty of power—225 HP at the drawbar. Cable-controlled, it loads and unloads quickly, with positive action for handling sticky materials that foul up ordinary units. Big tires float it over muddy or sandy terrain. Three-point suspension allows the DW20 to move over bumpy going with four wheels on the ground. Power-packed traction licks adverse grades. And it's a *safe* rig—operators handle it with the confidence that spells output. All these—and many other advantages—contribute to *fast cycle times.*

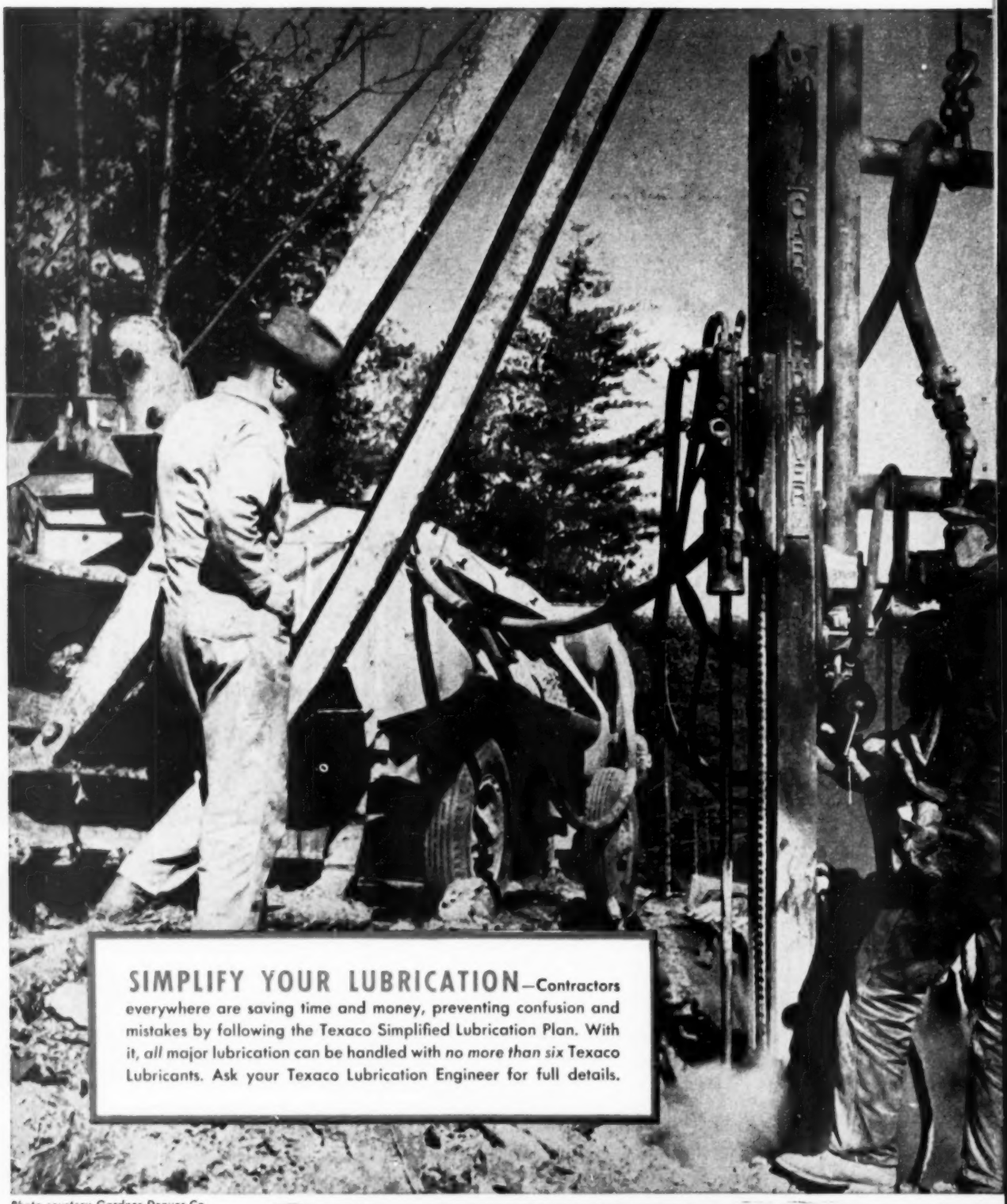
Make it *prove* its performance to you *on your job.* Your Caterpillar Dealer will be glad to demonstrate. Remember, he's always available for on-the-spot service. Call him today!

Caterpillar Tractor Co., Peoria, Illinois.

CATERPILLAR*

*Both Cat and Caterpillar are registered trademarks — ®

NAME THE DATE... YOUR DEALER WILL DEMONSTRATE



SIMPLIFY YOUR LUBRICATION—Contractors everywhere are saving time and money, preventing confusion and mistakes by following the Texaco Simplified Lubrication Plan. With it, *all* major lubrication can be handled with *no more than six* Texaco Lubricants. Ask your Texaco Lubrication Engineer for full details.

Photo courtesy Gardner-Denver Co.

TEXACO

TEXACO

WHAT EVERY COMPRESSOR OPERATOR SHOULD KNOW

Years of working with air compressor operators in every field have shown Texaco Lubrication Engineers that clean, low-cost performance comes only when you lubricate your compressors with an oil that's *exactly right* for *your particular* operating conditions.

That is why there is a complete line of Texaco air compressor oils — one to assure maximum efficiency and economy whatever the type or size of your compressors, whatever your operating conditions. Let a Texaco Lubrication Engineer help you select the proper one.

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Find out how Texaco can help you keep all your machines working more efficiently, bring down your costs. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

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building tough roads . . . digging hard rock

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POWER SHOVELS, CRANES, DRAGLINES, CLAMSHELLS, PILE DRIVERS AND HOES
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10 TO 60 TONS CAPACITY
CRAWLER, TRUCK, OR TRAILER-MOUNTED
MOBILCRANES
DIESEL, GASOLINE OR ELECTRIC

9314

There's "Gravy" even in the rough jobs, with OSGOOD Machines setting the pace. They're engineered throughout for smooth operation and long life on roads . . . quarries . . . coal loading . . . demolition jobs.

OSGOOD'S "Torque Converter—Air Tube Clutch" combination is a natural. Speeds up production . . . eliminates "bouncing" and shock . . . with far less wear, less down time and savings up to 25% in maintenance costs.

"It's the smoothest machine I ever operated," says the man at the controls.

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MARION, OHIO

OVER 100 YEARS OF ENGINEERING PROGRESS

PAVE A BLOCK

with Natural Rubber

. . . and Test in Your Community

America's Newest Highway Development

In every city, town and village the battle goes on against rising highway costs.

How about *your* community?

If your community, like many others, is fighting a losing battle, here's exciting news for you and for every highway official and taxpayer in your city or town.

Laboratory tests to date show that natural rubber powder, added to ordinary asphalt paving mix, will make roads that last longer, require less repair and cost less in the long run. When proven by test roads, this will mean millions of dollars of savings for the taxpayers.

Natural rubber-asphalt test roads have already been laid in nineteen states in the U. S. and in several provinces of Canada. According to a recent survey, already over a third of American highway engineers are convinced that rubber roads will become *standard* in this country.

How to Test Natural Rubber Roads by PAVE A BLOCK Plan

By *paving a block* with natural rubber-asphalt, any town or city can make its own test under its own particular climatic and traffic conditions to find out how much money rubber roads will save them in years to come.

A natural rubber test section is inexpensive and easy to lay. It requires only the addition of a small amount of natural rubber powder to the mix, using conventional paving methods and equipment. The natural rubber powder costs less than $500 for the average block.

Write Today for Complete Information

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1631 K Street, N. W., Washington 6, D. C.

Natural Rubber Bureau Research Laboratory
Rosslyn, Virginia

Natural Rubber Bureau
1631 K Street, N. W., Washington 6, D. C.

Please send me, without obligation, information on how to PAVE A BLOCK with natural rubber-asphalt road surfacing.

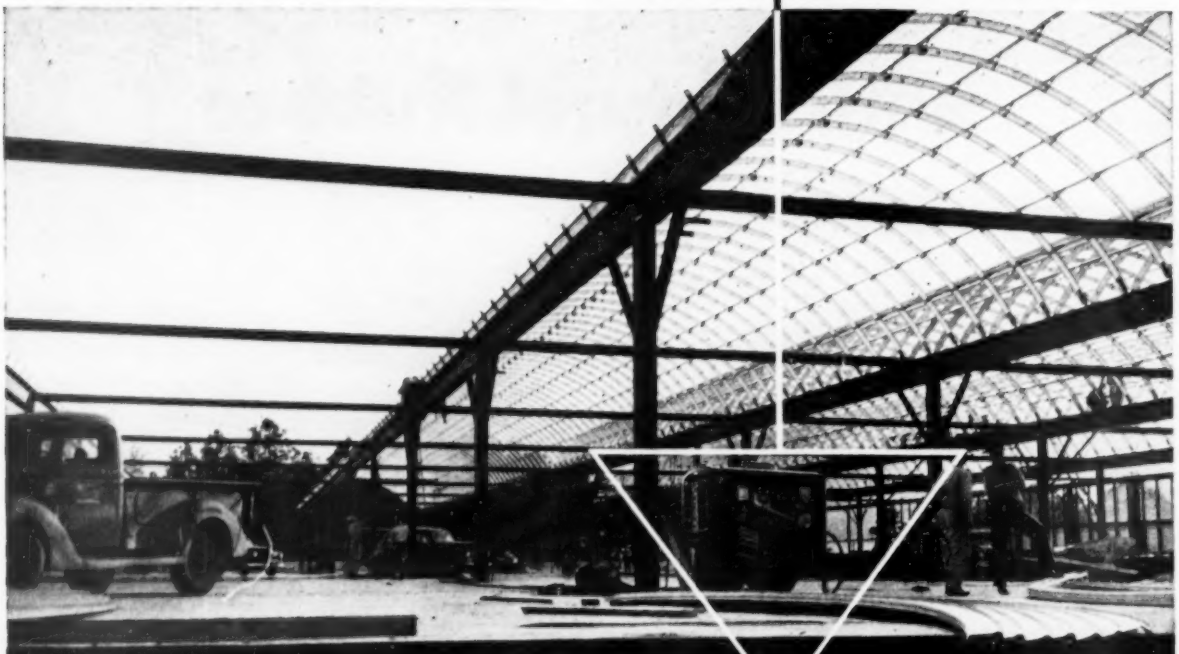
NAME.....

TITLE.....

STREET.....

CITY.....STATE.....

SPEED? | SAVINGS?



You get both with | SCHRAMM AIR COMPRESSORS

Here you see a Schramm Model 60 *UniStage* Air Compressor furnishing air for Steel Fabricators operating nut runners on a job by McRan Company, Houston, Texas.

Regardless of the job, Schramm Compressors provide speed and economy.

Schramm advantages:

FUEL SAVINGS UP TO 50% . . . Pneumastat Control

SIMPLIFIED DESIGN . . . Eliminates two-staging and intercoolers

SAFETY FEATURES . . . Electric Push-Button starter

GREATER VOLUMETRIC EFFICIENCY . . . Mechanical Intake valve.

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Sent FREE upon request.

Write on your business letterhead or enclose business card and address reply to SCHRAMM, INC., Dept. SMH, West Chester, Pa.

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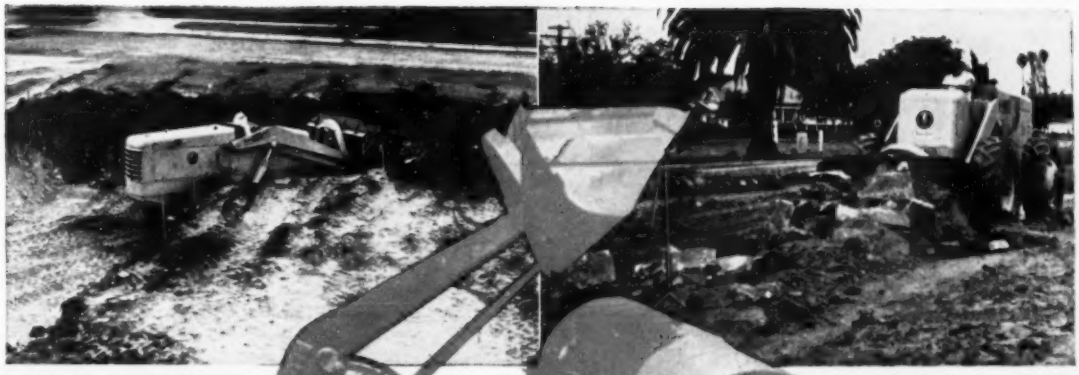
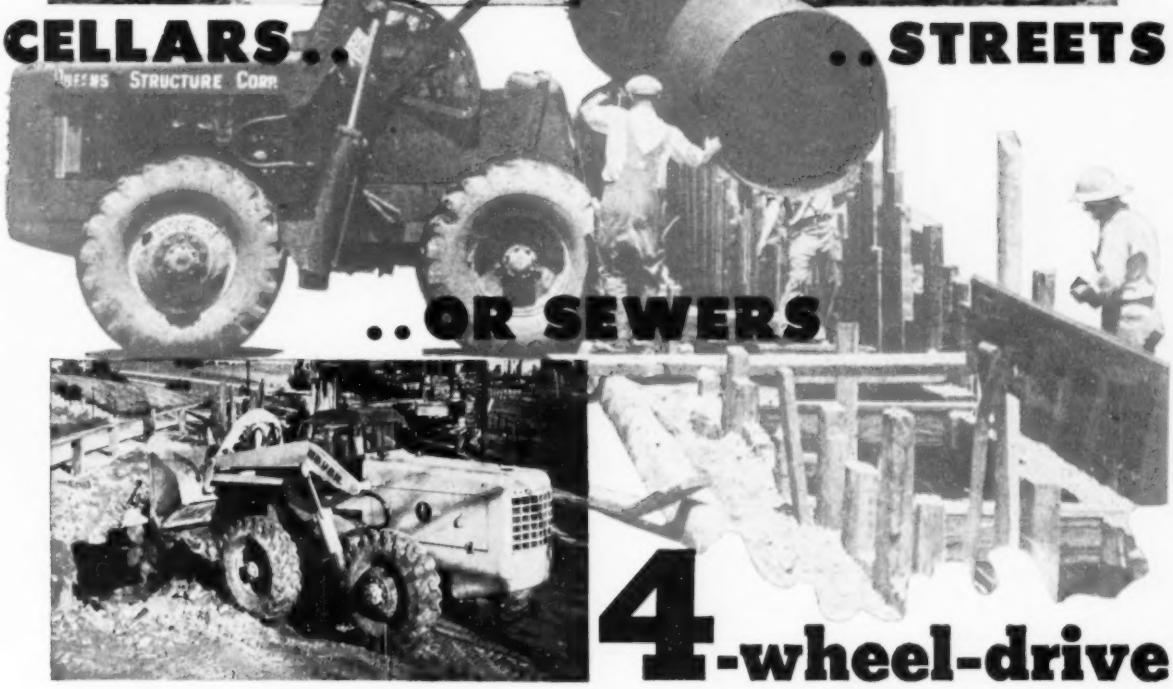
A SIZE AND MODEL FOR EVERY AIR NEED



CELLARS... ..STREETS



..OR SEWERS

4-wheel-drive does a job

Amazing is the word for the variety of work that public works departments and contractors find for their 4-wheel-drive "PAYLOADERS." In fact, the range of uses of these versatile tractor-shovels is limited only by the ingenuity of their owners and operators.

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WRITE for full information on any of the "PAYLOADER" models: Four-Wheel-drive HM — 1½ yd. and HR — 1 yd.; Rear-wheel-drive Models HY — 1¼ yd., HF — ¾ yd., HE — ½ yd.; Front-wheel-drive Models HAH — ½ cu. yd., HA — 12 cu. ft.

SAY HUFF

PAYLOADER®

THE FRANK G. HOUGH CO. • Since 1920

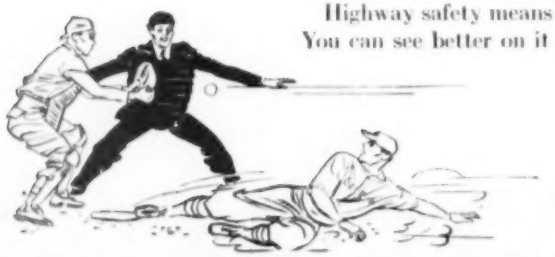
is less likely to happen on CONCRETE

A Georgia State Highway Department report, "Traffic Accidents—Highway Conditions," offers evidence of the safety of concrete pavement.

From this report a year's accidents on nine federal routes with 677.44 miles of concrete and 1437.74 miles of the other most commonly built pavement were analyzed. Traffic volume on the two types was about equal.

Accidents due to human frailty or mechanical failure were omitted. That left 257 accidents involving eight deaths, 177 injuries and $139,672 of property damage. *For equal traffic there were 2.38 times as many accidents, 3.25 times as many deaths, 4.11 times as many injuries and 4.02 times as much property damage on the other pavement as on concrete.*

Highway safety means good engineering. It also means concrete paving. You can see better on it at night and it's skid resistant, wet or dry.



the SAFE pavement is concrete

PORTLAND CEMENT ASSOCIATION

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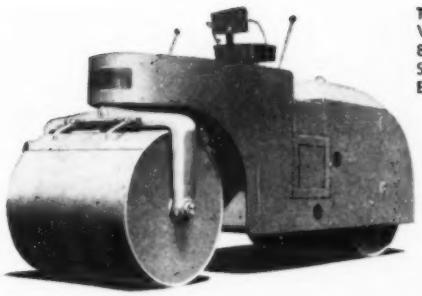
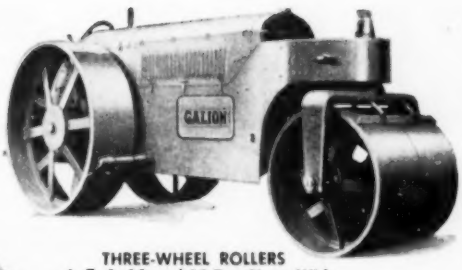
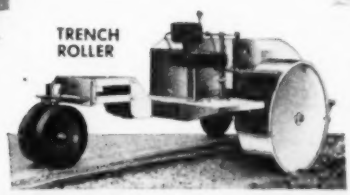
A national organization to improve and extend the uses of portland cement and concrete through scientific research and engineering field work



TANDEM ROLLERS
Variable Weight: 5-8, 8-12, and 10-14 Ton Sizes. Gasoline or Diesel Engine.

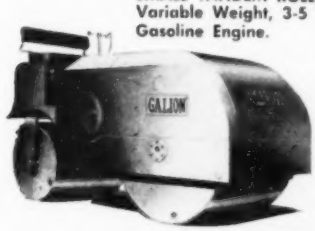


TRENCH ROLLER



THREE-WHEEL ROLLERS
6, 7, 8, 10 and 12-Ton Sizes. With Cast or Variable Weight Ballastable Steel Rolls. Gasoline or Diesel Engine.

SMALL TANDEM ROLLER
Variable Weight, 3-5 Ton. Gasoline Engine.



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GALION has had forty-six years of experience building-in the values that mean the most to you —

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DEPENDABILITY
ECONOMY
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EASY MAINTENANCE
LONG LIFE

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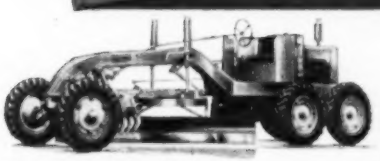
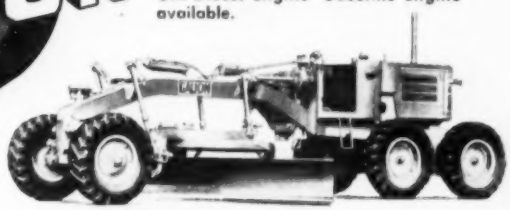
Cable address: GALIONIRON, Galion, Ohio

ESTABLISHED GALION 1907

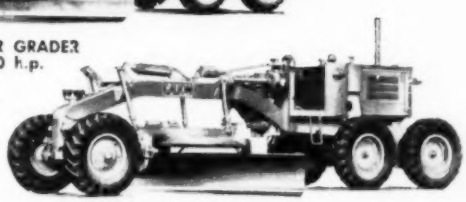


No. 503 MOTOR GRADER
Economy-Size, 40 h.p. Gasoline Engine. Diesel Engine available.

No. 104 MOTOR GRADER
Heavy-Duty, 76 h.p. IH or 85 h.p. GM Diesel Engine Gasoline Engine available.

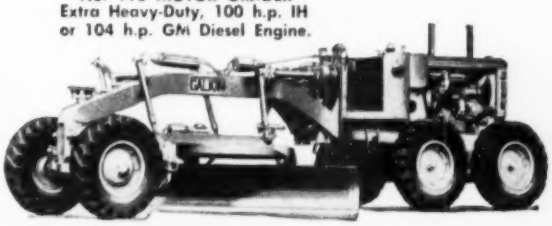


No. 303 MOTOR GRADER
Medium-Duty, 50 h.p. Diesel Engine. Gasoline Engine available.



No. 203 MOTOR GRADER
Medium Heavy-Duty, 70 h.p. Diesel Engine. Gasoline Engine available.

No. 118 MOTOR GRADER
Extra Heavy-Duty, 100 h.p. IH or 104 h.p. GM Diesel Engine.



U.S. ROYAL

CON-TRAK-TOR

FULL LUG

Cuts Costs for Contractors!

This is the power tire for the grueling hauls! With *triple* impact protection—extra inter-ply rubber layers, double shock-pads, rock-resister cap-plies. With *exclusive* full-lug traction that *pulls* where you used to stall. With all-around tire *economy* that starts from the hour you mount it! **Also available in Nylon for heaviest duty!**

Your U. S. Royal Dealer has complete proof—phone him today!

Speed specialized jobs with these great U. S. ROYALS!

U. S. ROYAL FLEETMASTER
Smooth rolling *on* the road, superior traction *off*. 70% more trend depth!

U. S. ROYAL ROAD TRACTION
New steering ease where most hauling is on-road at reasonable speed.

U. S. ROYAL LUG TRACTION
Best for high traction at low speeds off the road or on unimproved roads.

LATEST TIRE INFORMATION NO COST, NO OBLIGATION

Just out—new 64-page booklet—get it FREE. Includes engineering and service aids, load and inflation tables, dual matching, weight-charts, much more. Write U. S. Royal Truck Tire Department, United States Rubber Company, Dept. A, 1230 Avenue of the Americas, New York, N. Y.

U. S. ROYAL TIRES *Product of* UNITED STATES RUBBER COMPANY

"GENERAL CONTRACTOR"
and real money maker!

* Another contract for Gradall! To uncover pipes for repairs in oil refinery, Gradall operator can "feel" his way around other pipes and obstacles so none are damaged.

THE GRADALL is no "specialist". It's always ready to tackle all kinds of jobs—to make money for you on almost any contract you'll ever get!

Gradall carries its own quickly interchangeable attachments—always ready for work. It can get into, and work out of, places no other machine can go. Its hydraulic *down pressure* and telescoping *arm-action* boom give you the power and pin-point accuracy to work to hand-finish "specs". It eliminates costly clean-up hand labor.

And more important to you, because the Gradall *is* a "general contractor" you'll be able to bid on more jobs—to make more money. But let your Gradall Distributor *prove* it to you—ask him for a field demonstration on your own work.

Gradall makes money for you on all these jobs and many more

- Trenching and backfilling
- Excavating
- Placing tanks, culverts, curbs, etc.
- Sloping and grading
- Ditch digging and cleaning
- Ripping and loading old pavement
- Hand finishing and clean-up

Gradall Distributors
in over 75 principal cities
in the United States and Canada

Gradall
DIVISION OF WARNER & SWASEY Cleveland
PRECISION MACHINERY SINCE 1880

YOU CAN PRODUCE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY MACHINE TOOLS, TEXTILE MACHINERY, CONSTRUCTION MACHINERY

Marion 10-yd. Rock Body, equipped with twin telescopic, double-acting hoist, for off-the-road operation.

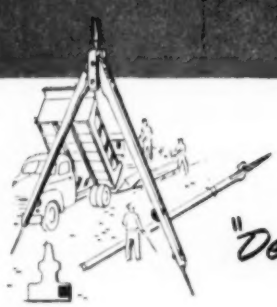
A New Approach To *Special* Haulage Problems

● Marion offers a new approach to your haulage problems . . . an experienced approach that is coupled with engineering and manufacturing ability to design and produce whatever body and hoist equipment is needed for your particular operation.

Marion produces many standard models, too —we feel they are the finest on the market. But if your transporation needs call for something a little different, or even radically different, Marion can design and build it for you . . . quickly and economically.

To those who want experienced, imaginative assistance in the review of their haulage procedures, Marion offers a service which is unmatched in the industry today.

Your inquiries are welcome.

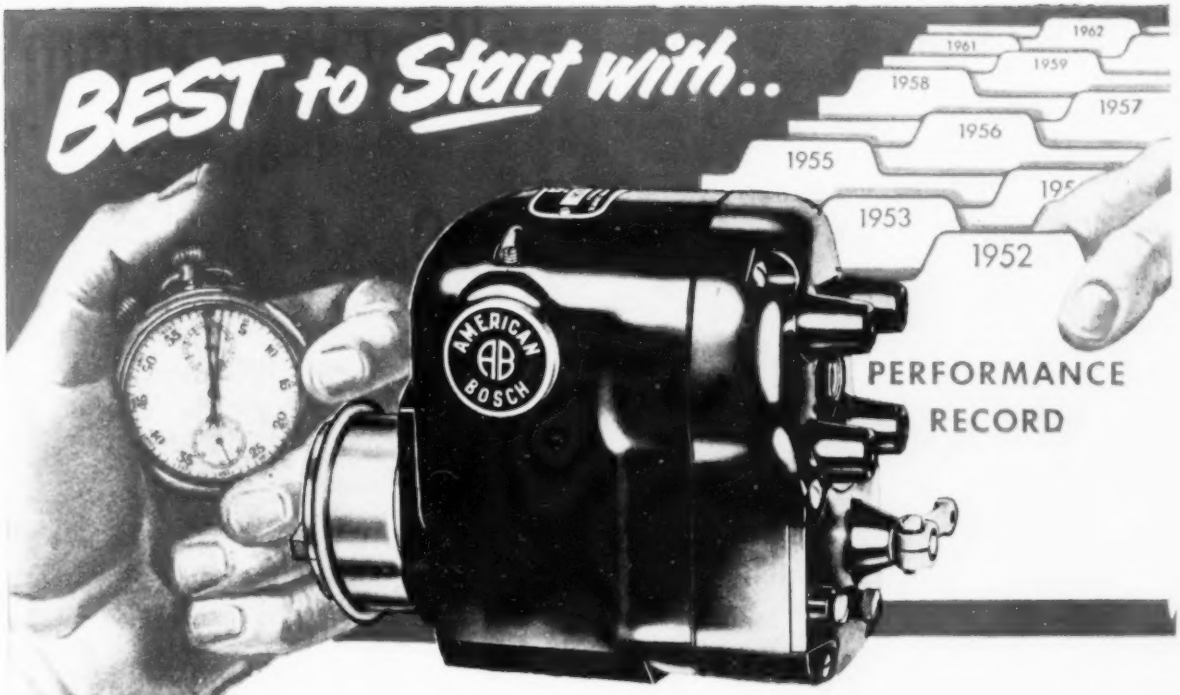


"Designed on the Job"

MARION
BODIES AND HOISTS

METAL PRODUCTS CO.
Marion, Ohio, U. S. A.

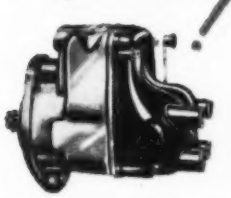
Manufacturing a complete line of standard and special hydraulic hoists and dump bodies.



BEST in the Long Run!

AMERICAN BOSCH MAGNETOS

Here's Trouble-free **SPARK IGNITION** *for Your* **WISCONSIN V-Engine USERS!**



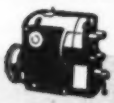
The sensational new American Bosch (4 pole) MSA Magneto . . . comes packaged complete, ready for easy, swift installation.

Time is money where construction equipment is concerned. American Bosch Super Powered Magnetos save on-the-job time for you. From starting time measured in seconds to trouble-free ignition measured in years, these rugged, power-packed Magnetos provide the constant, faultless spark that means maximum efficiency at all operating speeds and loads.

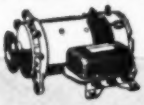
American Bosch Magnetos are precisely engineered for long, economical life on many types of construction equipment—from the biggest, heavy-duty engine right down to the most modern, high-speed power unit. That's why they are preferred as original equipment by many leading engine manufacturers.

With American Bosch you save to start with because of a liberal Trade-In Allowance on the old magneto you replace . . . you save in the long run because of dependable performance. Write today for all the facts and the name of your nearest Sales and Service Agency. American Bosch Corp., Springfield 7, Mass.

AMERICAN BOSCH



Automotive and Aviation Magnetos

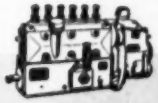


Generators and Regulators

Components for Aircraft Engines

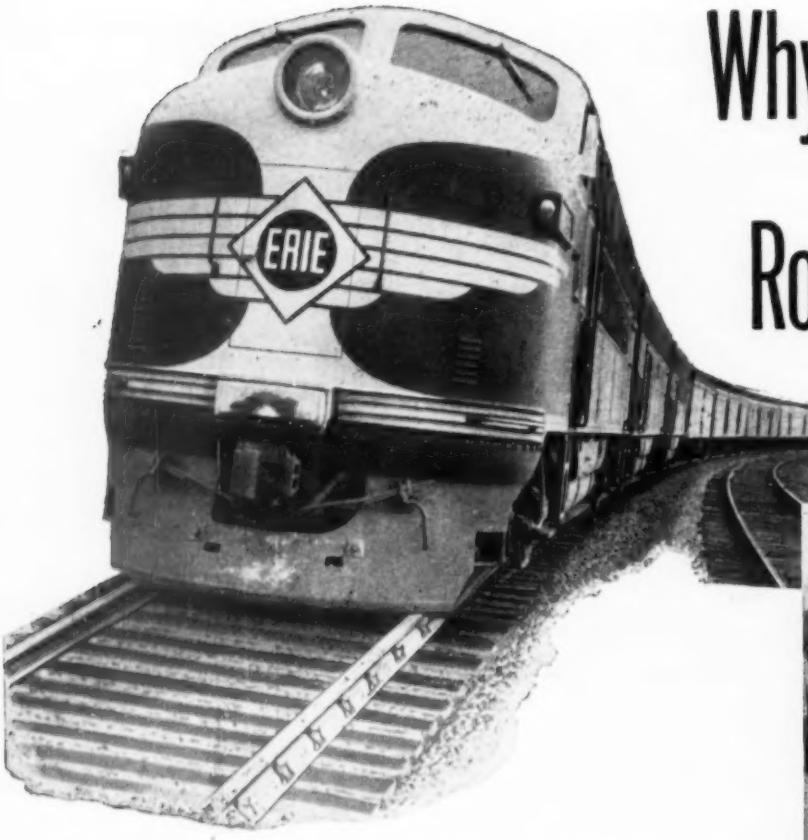
All Electric Windshield Wipers

Ignition Coils



Diesel Fuel Injection Equipment

Why Run a Train ON Road Forms?



Super-Strength HETZEL ROAD FORMS

LAST LONGER—REDUCE MAINTENANCE

Heltzel believed they built the strongest, most serviceable road form in the world. They decided to submit their form to a series of grueling tests to find out just how much abuse it could take.

First of all, they bolted a Heltzel form to a similar form of another make. Inserting a jack at the center point they applied pressure to compare bending moments. The Heltzel form remained rigid while the other form weakened and bent to the pressure.

Secondly, they put the two forms to an impact test. Two men wielded sledges and alternately attempted to smash the forms apart. Here again the Heltzel form withstood the punishment as the second form was damaged beyond repair.

Finally, they set up two lines of Heltzel forms and backed a loaded freight train over them without a sign of failure.

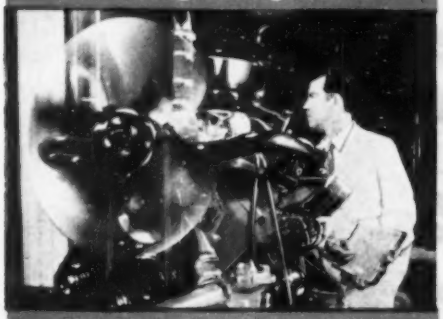
What does all this prove? Simply that when you buy Heltzel forms you're getting the best that money can buy at no increase in price. A road form must be able to withstand punishment year in and year out, with replacement held to a minimum. That's why Heltzel engineers have gone to such great lengths to design and build and to prove the Heltzel form is the finest ever made.

Let Heltzel prove it to you. It will pay handsome dividends. For additional information, or the name of the Heltzel representative nearest you, write THE HELTZEL STEEL FORM AND IRON CO., WARREN, OHIO.

Write for Bulletin K-19 NOW!

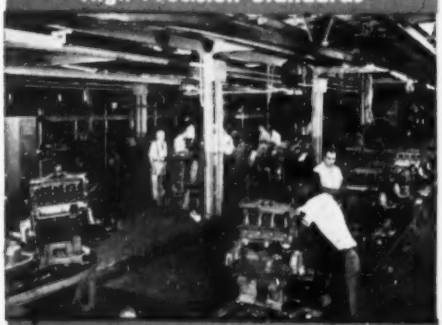
You'll be far ahead of the field with FORD INDUSTRIAL ENGINES!

Constant Engineering Advances



Matchless Research Facilities

High-Precision Standards



Mass Production Savings

Always at your Service

Experienced Ford Sales Engineers will gladly prepare recommendations for the efficient use of Ford Industrial Power in your application.

YOUR JOB IS WELL-POWERED WHEN IT'S FORD-POWERED!

Here's why—

These are hard-fisted facts that equipment manufacturers and users should know about!

As these pictures portray, the engineering and manufacturing facilities of the Ford Motor Company are unmatched in the field of Industrial Power. This has resulted in advanced features of engine design that are years ahead of the industrial field.

Let us mention just a few for example: Ford offers a choice of six engines varying in displacement from 134 cu. in. to 317 cu. in. in the popular range. Of these, four are latest design overhead valve, short stroke, low-friction, high-compression type, that deliver more actual power at the clutch than was formerly possible in any engines of comparable size. Features include precision-molded, fully counter-balanced crankshafts; full-flow oil filters; free-type, self-rotating valves; rigid, deep-skirt crankcase and many others. These advancements mean longer engine life and lower operating cost.

Every Ford Industrial Engine or Power Unit is a complete assembly, fitted with a long list of standard equipment *at no extra cost*. All are *thoroughly tested* before shipment and are *ready-to-run!* In a word or two, Ford Industrial Power provides unexcelled efficiency . . . not only more power per pound, but more power per cubic inch displacement at low piston speed.

We will be happy to send you descriptive folders with complete information. Why not write or . . . if necessary . . . wire us today?

INDUSTRIAL ENGINE DEPARTMENT
FORD MOTOR COMPANY
15050 Woodward Ave., Highland Park 3, Mich.

Nation-wide Parts and Service Availability

Ford
INDUSTRIAL ENGINES AND POWER UNITS

22 HEILINERS

SPEED EARTHMOVING ON THE GARDEN STATE PARKWAY

NEW JERSEY

BIG earthmoving jobs like the $300,000,000 Garden State Parkway, and big-producing Heiliners just naturally go together. Heiliners combine all the advantages of fast loading, big capacity, plenty of power, high speed, and "tilting floor" positive forced ejection (the simplest and most efficient known!) with a host of other features that pay off in profit on any job.

- **8 HEILINERS for GEORGE M. BREWSTER & SON, INC.** of Bogota, N.J. are operating near Red Bank, N.J., moving over a million yards of sandy clay loam at a rate of 225-cu. yds. per hour per machine. Loading time per unit averages 45 seconds in 60 ft. and the 1200-ft. round trip time average is 3 to 3½ minutes.
- **5 HEILINERS for CONSTRUCTION AGGREGATES CORP.** of New York are moving 112-cu. yds. of sand per hour per unit on the section of the Garden State Parkway south of Morganville. Loading time averages 40 to 65 seconds in 200 ft., and average cycle time for the 8400-ft. round trip is 8 minutes.
- **4 HEILINERS for FRANK STAMATO & CO.,** of Lodi, N.J., are working near Eatontown and in Ocean County where the contractor had to meet a variety of tough conditions ranging from very wet to dry sand and gravel.
- **3 HEILINERS for J. F. CHAPMAN & SON** of Hillside, N.J., have contracts for grading, draining and structures near the north end of the Parkway working in material ranging from rock and shale to sand and gravel.
- **2 HEILINERS for REID CONTRACTING CO.** of Woodbridge, N.J., are operating near Toms River, and have a lot of tough conditions to meet such as a high water table, sand and gravel with clay and new haul roads.

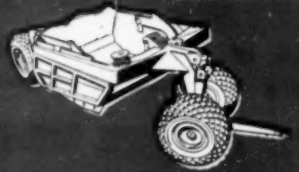
THE HEIL CO.

DEPT. 493, 3004 WEST MONTANA ST., MILWAUKEE 1, WISCONSIN

Factories: Milwaukee, Wis. — Hillside, N. J.

Sales Offices: New York, Union, N.J., Washington, D.C., Atlanta, Cleveland, Milwaukee, Detroit, Chicago, Kansas City, Denver, Dallas, Los Angeles, Seattle; Rio de Janeiro, Brazil

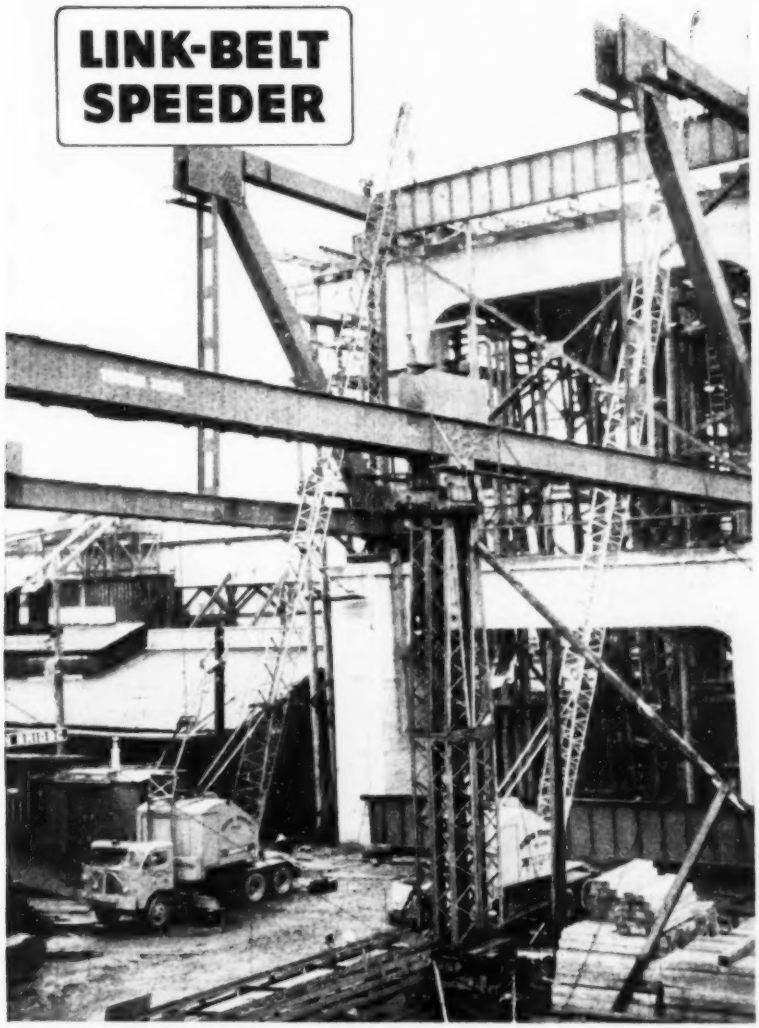
R-20



18 and 18-yd. Heilliner Scrapers 30-yd. Heilliner Bottom Dump Wagon 4, 9, 11 and 16-yd. Trailer Bowl Scrapers - Cable Power Control Units

Before you buy a Truck-Crane:

Check safety, mobility!



These two HC-90's, with 80-ft. booms, speed a steel erection job in Vancouver, B.C. At times, one of the rigs is equipped with a 90-ft. boom and a 20-ft. jib.

Patented Retractable Gantry is raised or lowered under power in minutes. Raised gantry decreases load on boom, hoist cable and mechanism . . . results in safer operation.

Link-Belt Speeder HC-51 and HC-90 Truck-Crane designs assure more work per shift, greater earnings per job

TAKE the HC-90 for example: here's a 25-ton capacity rig that has upper machinery specifically engineered to match its extra lifting capacity.

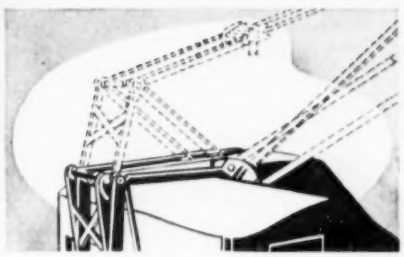
While this special design increases performance and stability, it's only one of the many advantages you get with a Link-Belt Speeder. In addition to rugged all-welded construction and heavy-duty components throughout, there are features such as: patented retractable gantry, hook-type conical shaped rotating rollers and pin-connected hinge-type boom.

Then, too, with ten speeds forward and positive drive to four full-floating rear wheels plus removable rear outriggers, the fully convertible HC-90 travels and works almost anywhere. It's this quick mobility that helps turn small, scattered assignments into real profit-makers.

For details on the 25-ton capacity HC-90, see your distributor or write for catalog 2350. For facts on the 12½-ton capacity HC-51, ask for catalog 2428.

LINK-BELT SPEEDER CORPORATION
Cedar Rapids, Iowa

13.364



LINK-BELT SPEEDER
CORPORATION
BUILDERS OF A COMPLETE LINE OF CRAWLER, TRUCK AND WHEEL-MOUNTED SHOVEL-CRANES

FACTORY-TRAINED DISTRIBUTOR SALES AND SERVICE SPECIALISTS ...EVERYWHERE

STOP WASTING MONEY BY THE TRUCKLOAD

Go White!

YOU NEED the most efficient, most dependable kind of trucks for today's schedules . . . today's costs of doing business . . . today's work conditions.

That's why you see so many Whites in excavating, road-repair and maintenance service and dump operations.

Tailored to the exact needs of your work, Whites have the power and the rugged reliability to get *more* work done . . . in *less* time . . . at *lower* cost than any other truck you can buy.

Find out how Whites save money in *your* service. See your White Representative.

This WHITE Model 302264 is in road repair and maintenance service for Maricopa County, Arizona.

THE WHITE MOTOR COMPANY • *Cleveland 1, Ohio*

For more than 50 years the greatest name in trucks

Check these White advantages . . .

- √ WIDE RANGE of models to meet every hauling operation.
- √ OUTSTANDING maneuverability because of short wheelbase, wide tread front axle and short turning radius.
- √ NEW WEIGHT distribution permits larger loads within legal limits . . . extra payload . . . more work done.
- √ SINGLE drive axle units with single or double reduction or two-speed axles.
- √ TANDEM drive units with double reduction axles.
- √ SINGLE or double channel frame.
- √ TRANSMISSIONS—various transmissions and auxiliary transmissions to meet local operating conditions.

A Message to Men in charge of Ice Control:

Why You Should Order STERLING AUGER-ACTION ROCK SALT NOW!...

While You Have the Trucks and the Time... To Put It Where You Want It—When You Need It!

Why risk a public clamor next winter when it's actually more economical to be prepared? By ordering your STERLING ROCK SALT *now* you can cut handling costs—using your trucks, in slack periods during the next month or so, to distribute supplies to strategic storage points.

Then, when the first snow hits and every truck and every minute counts, you will *not* have to use your equipment to unload shipments—and for long hauls from primary storage to remote areas.

Your trucks and your men are free to start immediately *spreading* salt, not hauling it—*removing* snow, not driving through it.

No Losses in Storage. STERLING ROCK SALT, with only elementary covering, may be safely stored without loss at as many pickup points as you choose—instantly available to put your plan of attack into operation the minute the storm strikes.

Follow the Lead of the Biggest City and the East's "Snowiest" State. New York City and the State of New Hampshire, each with rugged snow clearance and traffic problems, use decentralized storage and *beforehand* ordering. Experience has proved the efficiency and economy of a definite pattern of operation, established *beforehand*—maintained throughout the winter.

Send for this FREE Booklet
"HOW TO PROVIDE LOW-COST ROCK SALT STORAGE"
Contains 11 ways to store rock salt safely, economically—indoors or outdoors.

Avoid Public Criticism! Save Money! Be Prepared!

ORDER
STERLING AUGER-ACTION ROCK SALT
TODAY!

INTERNATIONAL SALT CO., INC., SCRANTON, PA.

SALES OFFICES
Atlanta, Ga. • Chicago, Ill. • New Orleans, La. • Baltimore, Md.
Boston, Mass. • St. Louis, Mo. • Newark, N. J.
Buffalo, N. Y. • New York, N. Y. • Cincinnati, O. • Cleveland, O.
Philadelphia, Pa. • Pittsburgh, Pa. • Richmond, Va.

GULF PRODUCTS *and* FINE SERVICE

keep equipment rolling

on U. S. Naval Air Station Project

Ballenger Paving Co., Greenville, S. C., has the contract for extending and widening runways and taxi strips at the U. S. Naval Auxiliary Air Station, Sanford, Fla. The contract involves laying 134,000 square yards of 10-inch reinforced concrete pavement. The Ballenger Paving Co., as well as their hauling contractor, R. S. Woodleif, also of Greenville, S. C., get top performance from equipment by the use of Gulf quality lubricants and fuels.

IT'S a speedier, more profitable job when equipment performs smoothly and dependably. And the use of quality petroleum products is one of the surest guarantees of this kind of performance.

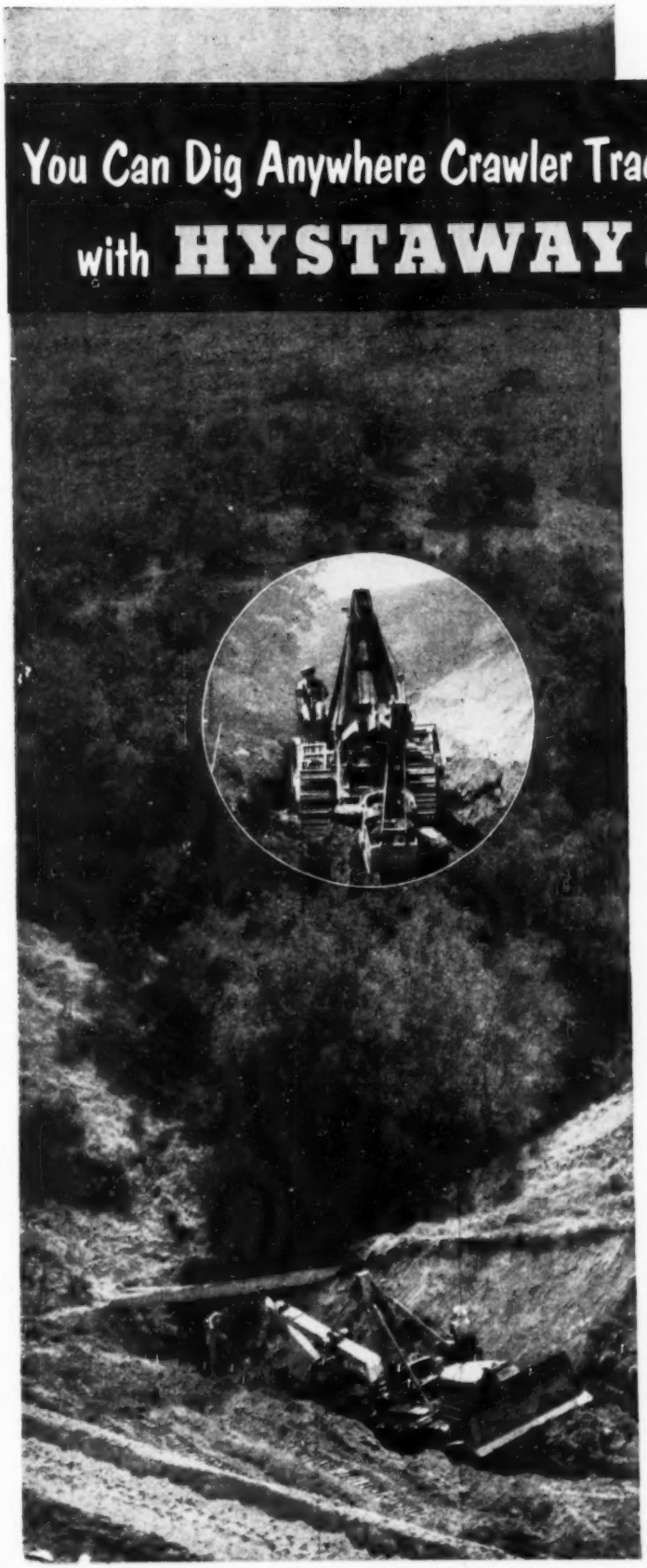
That's why so many contractors on the big, tough jobs specify Gulf lubricants and motor fuels. They have found that Gulf lubricants provide better protection for every gear and bearing; and that Gulf fuels help insure efficient engine operation.

Gulf products and fine service work as a team to help contractors get more hauls, fewer overhauls, and bigger profits!

Let us discuss with you how they can help you on your next job. They are available to you through more than 1400 warehouses. Write, wire, or phone your nearest Gulf office.

GULF

You Can Dig Anywhere Crawler Tractors Go with HYSTAWAY...



and travel at tractor speed. This means more jobs done, faster, with less equipment.

Only HYSTAWAY has *true* crawler tractor mobility and maneuverability because it mounts on a Caterpillar track-type tractor. Full track oscillation enables the Hystaway to travel over rough terrain without excessive damage to crawler equipment . . . eliminating the cost and necessity of having expensive standby hauling equipment on hand. Hystaway is the *only* revolving shovel with a complete track-type tractor for its undercarriage! This is the feature that makes the Hystaway the most modern excavator-crane available today.

Other important HYSTAWAY MONEY-MAKING FEATURES INCLUDE: The ability to do excavator-crane work and bulldozing with one piece of equipment; heavy duty diesel tractor engine for power; no tail swing, permitting work in close quarters; mountability on new or used Caterpillar track-type tractors.

And *only* HYSTAWAY combines these *seven* different machines in one!

1. Shovel
2. Backhoe
3. Dragline
4. Clamshell
5. Crane
6. Pile Driver

7. PLUS BULLDOZER!

Get full Hystaway details from your Caterpillar-Hyster Dealer...or write for Catalog 1235 to:

HYSTER COMPANY

2995 N. E. Clackamas St.
Portland 8, Oregon

1895 N. Adams Street
Peoria 1, Illinois

HYSTER

THERE'S PROFIT IN HYSTER POWER

7-yd. rig moves 120 pay

Excavating 20,000 yds. for a subdivision near Nacogdoches, "D" moves 120 pay yards hourly over 2000′ cycles. Loads, with 101 h.p. pusher, average 6 pay yards in the damp sandy clay. Load time, 20 to 25 seconds . . . distance, about 60 ft.

Pivot between scraper, prime-mover eliminates tilting strains.

90° turns (12′9″ radius) cut important seconds off each cycle.

"D" spreads 6-yd. load of sand in 5 to 8 seconds over 50 ft.

R. G. LeTOURNEAU
LONGVIEW, TEXAS
VICKSBURG, MISS.
STOCKTON, CALIF.
PEORIA, ILL.
WEST MONROE, LA.

HIGH-SPEED, RUBBER-TIRED EXCAVATING • HAULING • LIFTING EQUIPMENT

yds. hourly on 2000′ cycles

D Tournapull's 28 m.p.h. speed pays off on job and between jobs

T. R. Vardeman & Son, Nacogdoches, Texas, have been moving dirt for 3 seasons with electric-control D Tournapulls. They bought their first "D" in 1950 . . . have added 3 more "D's" and a 19 m.p.h., rubber-tired Tournatractor to their fleet since then. Owner T. R. Vardeman reports these rigs are the fastest dirtmovers he's ever had, not only on the job but between jobs as well.

Here is the purchase record:

1st D Tournapull — Sept 1950 2nd D Tournapull — Feb. 1951
1st Tournatractor — Nov. 1950 3rd D Tournapull — Mar. 1951
4th D Tournapull — Feb. 1952

When you figure job production at "1000 yards per Tournapull per 10-hour day with average efficiency at 95%," as reported by Superintendent Sam Frizzell, you can see the reason for the repeat orders. Then look at the history of kind of jobs handled:

471,000 yards on 11 scattered jobs, in one year

1. Started by leveling streets for 50 blocks of housing at Longview.
2. Next — 55,000 yds. for Highway 69 at Lufkin (90 miles away).
3. Rigs then handled 29,000 yds. for farm-to-market road at Lufkin . . .
4. and 29,000 yds. for another near Nacogdoches.
5. Drove 20 miles through heavy traffic to level 18,000 cu. yds. at Hoya-Davidson Housing Project,
6. leveled 20,000 yds. for lumber storage, and
7. built 25,000-yd. dam; all these near Nacogdoches.
8. Moved 136,000 yds. on relocation of Hwy. 7.
9. Shuttled 55 miles across main highways to Kilgore for a 74,000-yd. sewage disposal plant job.
10. Drove back to Nacogdoches to move 5000 yds. on city streets.
11. 12-months closed by traveling 40 miles to Henderson to work a 35,000-yd. leveling contract.

Read what the Vardemans have to say about the reasons for this record in the next column. Then remember this is only one of many Tournapull success stories you've read in the papers . . . actual case histories with detailed production, job conditions, photos, and owner names and addresses for verification! Isn't it time for you to put *your* earthmoving on high speed rubber? Put just one "D" on your job as a service tool. You'll find it such a handy one-man trouble shooter, you'll want more. Then you'll discover it's a production tool, too. Don't take our word for it . . . find out for yourself! Why not ask your LeTourneau-Westinghouse Distributor for a demonstration?

Ask any Tournapull owner . . . but here's what the Vardemans say:

"Using LeTourneau equipment has taught us how to handle dirt jobs fast and economically. With our 4 Tournapulls and 1 Tournatractor, we move more dirt in less time than with any dirtmoving equipment we have ever owned or used." . . . *says T. R. Vardeman, Senior.*

"Tournapulls are the fastest and most economical dirtmovers we have ever used. Crawler-type rigs are outclassed by far when in competition with Tournapulls. Our operators like their ease of operation and negligible maintenance and repair." . . . *says T. Richard Vardeman, Junior.*

"Ours is an impatient outfit. When we start a job we like to roll without delays. Our D Roadsters and the Tournatractor certainly fulfill our dirtmoving requirements." . . . *says Sam Frizzell, Superintendent.*

"We like these D Roadsters. The electric controls help us move a lot of dirt easily." . . . *say Operators Frank J. Pantacion and R. G. Clifton.*

Tournatractor sets culvert on farm-to-market road. Unit also clears right-of-way, grades shoulders, loads stumps into dump trucks, push-loads scrapers, handles dozens of routine dozing jobs. "It's the best push-loader made," says Supt. Frizzell.

Tournatractor—Trademark Tournapull—Trademark Reg. U. S. Pat. Off. DF 167 H

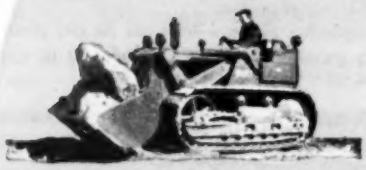
LeTourneau-Westinghouse Company

PEORIA, ILLINOIS

Proven toughest by the hardest work

PACAL BLADES

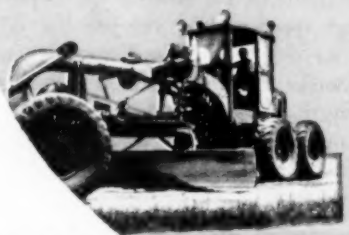
The high quality steel used in Pacal Blades proves its economy quickly on heavy jobs. Pacal Blades last longer because of their high abrasion and shock resisting qualities. Not only does Pacal offer longer blade life, but also more efficient cutting or loading and less time wasted changing blades. Pacal Blades are punched accurately for a perfect fit on any make machine.



***USE PACAL BLADES** on all your earthmoving equipment*

Use Pacal Heat Treated Plow Bolts on all your Pacal Blades. They're twice as strong—do not stretch or loosen.

Only Pacal Plow Bolts and Pacal Blades have kept pace with the increased horse power of today's earthmoving machines.



Write or call Department BK-93

Circular B 22

PAPER-CALMENSON & CO.

Telephone **NEstor 9456**

County Road B and Walnut Street, Adjoining Highway 36, St. Paul 8, Minnesota

with dependable GarWood "ROLLING WEDGE" ACTION

Here, in the heart of the hoist, is where the years-ahead design of Gar Wood's famous "Rolling Wedge" cam and roller action pays off in superior performance and unmatched dependability. Exclusive "Rolling Wedge" cam and roller action provides built in control of oil pressure during the entire lifting cycle. Oil pressure remains uniform at all times—there are no sudden changes from low to high or from high to low. Pump life is substantially lengthened and sudden shocks to hydraulic system are eliminated.

Scientific cam design with exclusive, lift-proportioned cam contour provides maximum lifting effort at the start of the lift *without increased hydraulic pressure*. Reduced cam entering angle gives greater lifting effort with slower, smoother action at the start. Stresses to hoist and chassis are eliminated. As the rollers are forced deeper, cam contour changes to provide accelerated lifting as the center of the mass is moved towards the discharge end of the body. *Oil pressure remains uniform during this entire lifting cycle.*

For smooth, dependable operation—and for longer service life in rugged dump-truck operation—specify Gar Wood "Load Engineered" Dump Bodies and Hoists when you buy new equipment. There's a size and type to fit your needs exactly. See your nearby Gar Wood dealer soon or write direct for complete specifications and application information.

2M108

Gar Wood Industries, Inc.
36010 Main St., Wayne, Michigan
Att'n: Customer Service Dep't.

Please send me complete information about Gar Wood Dump Bodies and Hoists for my hauling job.

Name_____

Company_____

Address_____

City_____ Zone____ State_____

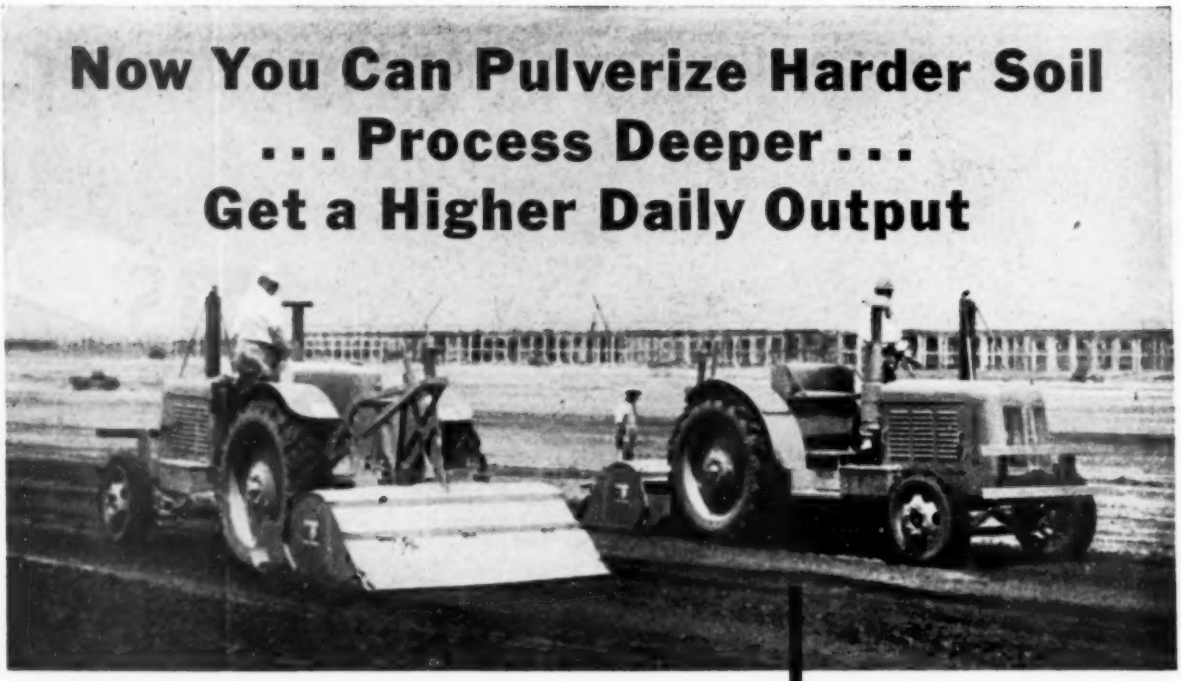
Describe operation briefly_____

GAR WOOD INDUSTRIES, INC.
WAYNE, MICHIGAN

GAR WOOD GW INDUSTRIES

TRUCK EQUIPMENT: Dump Truck Bodies and Hoists, Winches and Cranes, Refuse Collection Units, Elevating End-Gates. CONSTRUCTION EQUIPMENT: Excavators, Scrapers, Dozers, Ditchers, Spreaders, Finegraders, Truck-Mounted Road Graders

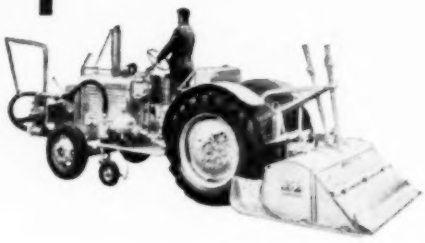
Now You Can Pulverize Harder Soil ... Process Deeper ... Get a Higher Daily Output



Two SEAMAN Self-Propelled MIXERS owned by Wright Contracting Co., at work on a portion of a large soil-cement project involving over one million square yards at the Albany (Ga.) Marine Depot.

with the

NEW HEAVY-DUTY 1953 SEAMAN TRAV-L-PLANT



The *NEW* Seaman Self-Propelled TRAV-L-PLANT is built to convert tough, difficult deep stabilization or compaction projects into fast moving high production jobs. You can pulverize harder clods and mix deeper than with any other mix in-plant travel plant.

Further, the Seaman TRAV-L-PLANT answers the ever-present questions:

"What can I do if aggregates are not properly coated in one pass?"

"If my soil-cement mix is not up to specification in one pass?"

With the SEAMAN — if binders are developing unfavorable characteristics due to any one of many conditions beyond the control of the roadbuilder . . . if gradation of aggregates still needs correction — *just make another pass with the SEAMAN* — or as many as you need to bring the job to perfection. You can afford it — with plenty to spare — because multiple passes with the SEAMAN are fast and very low in cost.

And with the SEAMAN, you have an all-purpose machine for *every* type of stabilization — with every binder, every size of aggregate up to 5" and every recommended native soil. There's never a *partial* mix when you process, blend and finish with a SEAMAN. And the material is firmly placed with uniform depth and density — partially precompacted, blended and ready for finish rolling.

Send for this Bulletin completely describing the SEAMAN TRAV-L-PLANT and the Self-Propelled MIXER. Shows field scenes, operating hints and complete specifications.

SEAMAN MOTORS Inc.

291 N. 25th St. • Milwaukee, Wis.

DIGGING PROBLEMS

are not the only problems!

Northwest Crawlers get you there and back!

That job you're on now? No problems perhaps, but what of tomorrow?

That's the thing about Northwests! They meet the daily, unexpected problems that every job presents.

Take Northwest Crawlers! They have proved themselves over miles of travel. Where there are grades to climb, streams to ford or rough going to negotiate, your Northwest gets you there — and back.

It's a *real* Rock Shovel — you're set for the toughest digging — sure of the highest output, in any digging. It is quickly converted and you have a recognized leader whether you operate it as a Shovel, Crane, Dragline or Pullshovel.

Whether at sea level or two miles up you are equipped with a properly engineered power plant plus the Northwest Dual Independent Crowd that utilizes force many other shovels waste entirely.

These things are worth money. They are advantages that are worth planning for. Now is the time to learn about Northwest features. Let us tell you the whole story.

NORTHWEST ENGINEERING COMPANY
1504 Field Building, 135 South LaSalle Street, Chicago 3, Illinois

NORTHWEST

SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

GM DIESEL
CASE HISTORY NO. IA5-40

OWNER: Flomaton Gravel Company, Flomaton, Alabama

INSTALLATION: GM 4-71 Diesel powers a Pekor 6" centrifugal pump on sand dredge. Pumps 400 to 450 feet to discharge table with 40-foot head. Engine replaced another make Diesel in 1947.

PERFORMANCE: Owner reports repowering boosted production 50% with no increase in fuel costs. He now pumps 35 to 40 cu. yds. per hour, operating 8 hours a day, year around. GM Diesel has required no repairs in six years.

It pays to STANDARDIZE on

GM
GENERAL MOTORS
DIESEL POWER

PUMPS 50% MORE SAND USES NO MORE FUEL

After seeing what this engine did, Owner A. R. Bethea powered two other dredges with General Motors Diesels. Besides being steady, dependable producers, GM Diesels' compactness and lighter weight permitted him to build lighter and less expensive dredges.

A GM Diesel engine boosts production on all kinds of heavy-duty jobs because, with power on *every* piston downstroke, it delivers smoother, steadier power. Its simple, rugged design keeps your equipment on the job and working at top speed. It has no troublesome high pressure fuel lines to cause costly delays.

And when service is needed, you'll find the cost surprisingly low. GM Diesel parts cost less. They're readily available everywhere. They're quick and easy to replace. If you want to boost production and reduce operating expense, find out about GM Diesel power. Contact your distributor or write us for complete information.

DETROIT DIESEL ENGINE DIVISION
GENERAL MOTORS • DETROIT 28, MICHIGAN
Single Engines . . . 16 to 275 H.P. Multiple Units . . . Up to 840 H.P.

110-Foot helping hand with 40-ton muscles...

A MARION CRANE

Bates & Rogers Construction Corporation of Chicago made good use of a MARION 372 special lifting crane when they gave Route 5 a big lift in the heart of Buffalo. Twenty-five piers, up to 95 feet high and scattered over .7 of a mile, are part of the $10,000,000 viaduct to put busy arterial traffic "upstairs." Resourceful use of steel shapes supported by jacks helped simplify preparation of forms for reinforced concrete cross beams. Three different types of pier construction were needed to cope with varying soil conditions.

One of the busiest machines on the job was a MARION 372 with a 110-foot boom and a 15-foot jib. Moving 10-layer scaffolding units, big sections of forms and materials for caissons were typical assignments. Operator Art Page likes the gentle, reliable MARION air control and the stability of the machine on its long, wide crawlers.

MARION cranes are versatile, dependable machines, worthy of the MARION name. Why not talk with your nearest MARION Distributor about the jobs they can do for you?

MARION POWER SHOVEL CO.
MARION, OHIO, U. S. A.

from 3/4 cu. yd. to 45 cu. yds.

OFFICES AND WAREHOUSES IN ALL PRINCIPAL CITIES

Move More

These 5 great quality features tell why a MICHIGAN

1 MICHIGAN AIR CONTROL . . . *FAST, SMOOTH, POSITIVE*

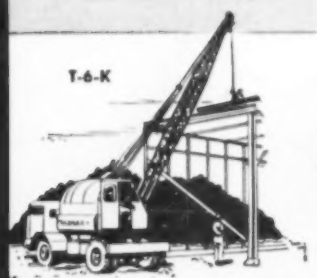
The MICHIGAN Line is famous for fast, smooth swing—no jerk, no grab—with finger-tip operation. Operator stays at peak efficiency all day because air-power does the work. A minimum of dead-weight inertia; and no static friction—6 hook rollers with anti-friction bearings assure smooth, effortless swing.

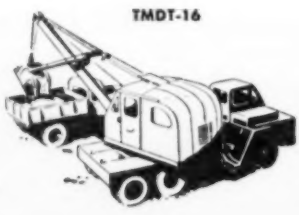
2 CIRCLE GEAR AND CENTER POST CAST INTEGRAL . . .

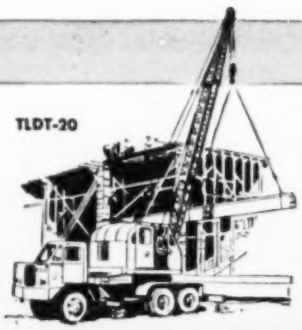
Take a good look at this—then compare it to the gear on any other machine built. See it in operation. Its internal tooth drive is inherently rugged and dependable. Hook-roller paths are cast integral and machined to a taper that matches the taper of the six rollers.

3 TURNTABLE DECK AND SIDE FRAMES CAST IN ONE PIECE . . .

Turntable shafts, ball-bearing mounted in the side frames, *can't get out of line*—eliminating a major cause of wear and replacements. That's why the turntable gives years of uninterrupted service. Hook roller mounting brackets also are cast integral with the machinery deck.


T-6-K


TMDT-16


TLDT-20

Series 8

with a MICHIGAN

"Nearly 500 yards of tough clay in 7 hours!... that's real earth moving!" *says Jim Smith, operator*

JOB	**County Road Ditch—80 rods, 8' x 6' x 3' bottom**
MACHINE	**TMDT 16—Diesel powered**
OWNER	**Van Buren County (Mich.), Road Commissioner**
YARDS HANDLED	**About 500 per day**
MATERIAL	**Clay**
FUEL	**8-10 gallons per day**
COMMENT	**"This is way ahead of former machines. Remote control is swell. Air control makes fast, easy operation. You can see what you're doing. Fine balance, too . . . " Jim Smith, operator for Van Buren County.**

Moves More Yardage faster, at low cost, dependably

4 MICHIGAN MS CLUTCH...

An exclusive advantage, entirely new—this single-disc double-faced clutch with six interchangeable segments on each face. Worn segments are easily replaceable *in the field*, in a matter of minutes—an extraordinary time-saver. A cool-running clutch, effectively ventilated, always efficient—no adjustments for temperature.

5 EXTREME EASE OF *MAINTENANCE and SERVICE*

Greasing time is negligible—a few minutes per day. Reasons:

- Anti-friction bearings instead of bushings
- Simplicity of MICHIGAN Air Control System—a single copper tube from each control valve to the clutch ram, instead of a complicated system of toggles, rods, joints, pins all requiring daily greasing.

For decisive proof that you get More for Your Money in a MICHIGAN, *see* the MICHIGAN Line in action—and check each machine, point by point, with other machines of equal capacity. See your MICHIGAN dealer—and write for literature.

C-16

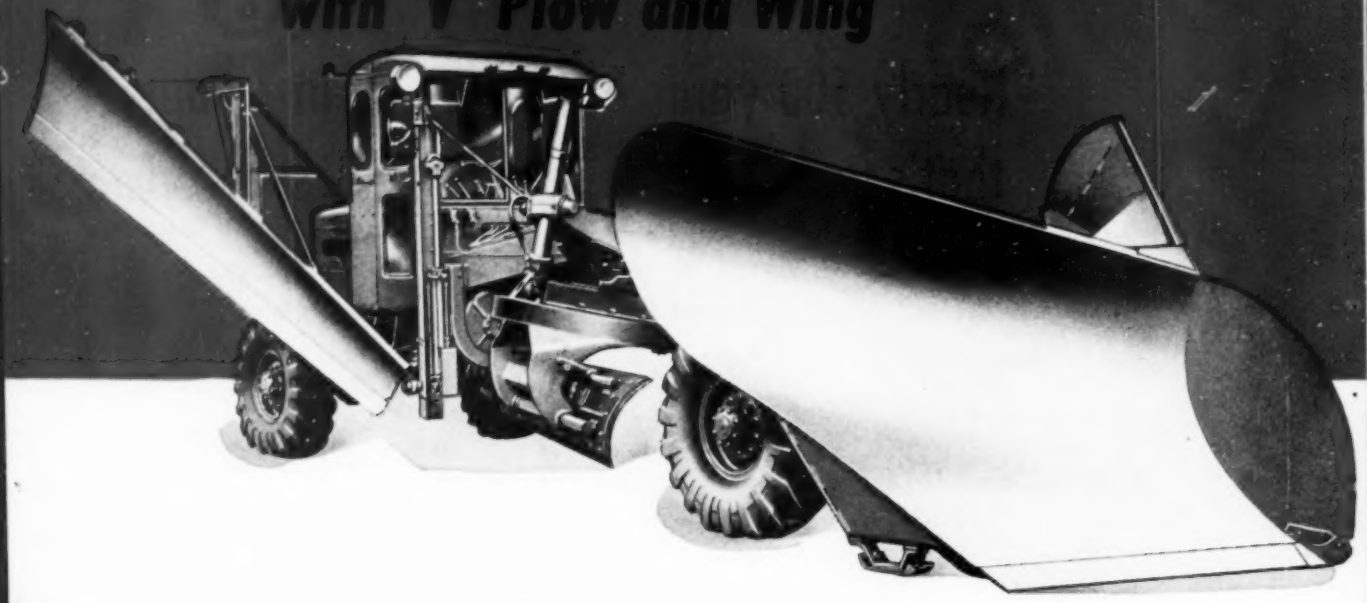
Construction Machinery Division

CLARK EQUIPMENT COMPANY

480 Second Street, Benton Harbor, Michigan, U. S. A.

B-R-E-A-K THAT

with "V" Plow and Wing



Opening a road through deep, hard-packed snow.

The tremendous power and directional control of Austin-Western's Four-Wheel Drive and Four-Wheel Steer Power Graders are supremely important in plowing snow. Only a grader with traction at both ends can resist the side thrust developed in handling heavy drifts. In breaking a road open, and particularly in widening out, power on the front wheels keeps the plow steadily going through without slipping or sliding. Rear steer counteracts side draft and adds the maneuverability so essential where the "going is toughest." Whether the snow is deep or shallow, light or heavy—any Austin-Western Grader equipped with a Giant Plow and Wing does a real job of fighting it.

Steadily punching a way through ice-crusted snow.

Rear steer is a great help in widening out.

Austin-Western

Power Graders
Road Rollers · Motor Sweepers

BALDWIN BLH LIMA-HAMILTON

Construction Equipment Division

Manufactured by
AUSTIN-WESTERN COMPANY
Subsidiary of Baldwin-Lima-Hamilton Corporation
AURORA, ILLINOIS, U.S.A.

BLOCKADE !

with this Powerhouse Combination

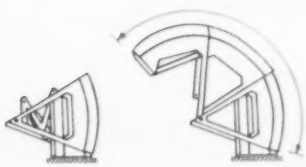
Austin-Western
SICARD

No matter what the snow problem, this combination is "tailor-made" for the job. City streets, trunk highways, farm-to-market roads can be opened and *kept* open with this outfit. The Sicard Snow Master handles *any* snow easily and accurately, either blowing it clear of the road, or loading it into trucks. With the power and control of Four-Wheel Drive and Steer, an Austin-Western Grader will take the rotary where it's needed in the shortest possible time and will keep it working in places inaccessible to ordinary machines. An Austin-Western Grader, plus a Snow Master . . . this is the "Powerhouse" combination—"Blockade Breaker" in the war with winter.

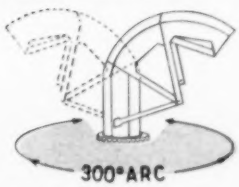
Opening a road in the Rockies. Note the depth of the snow.

"Precision" loading from any angle is easy with the Sicard.

Snow is blown any distance from 3 ft. to more than 150 ft.



Chute telescopes for long or short range casting.



Chute rotates for casting or loading to either side.

Blower Housing rotates. Casts to either side, or through chute.

"MAGIC-CARPET" MAKER

SPREADS
Material Evenly

COMPACTS
to Uniform Density

LEVELS
Automatically
Without Forms

Barber B G Greene

THE BARBER-GREENE TAMPING-LEVELING FINISHER

When the job calls for the highest quality bituminous surface, you'll do it best with the B-G Tamping-Leveling Finisher.

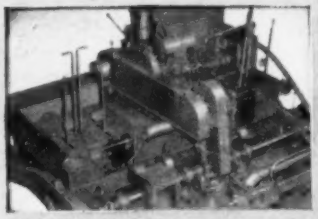
With this superbly designed machine, you are able to lay every type of mix — hot or cold — from clay stabilized gravel to high-type sheet asphalt. Whatever type mat you are laying, the B-G Finisher automatically measures the correct amount of compacted material — then simultaneously tamps, levels and strikes off to produce a ripple-free surface that is maintained under rolling and traffic. Because the material is compacted while it is being laid, you are assured of a surface of uniform density. And with the B-G leveling principle you compensate even for abrupt changes in the subgrade.

It will pay you to investigate this unequalled, universally preferred method of paving streets, highways, runways, parking lots, tennis courts and similar jobs. You will learn, for example, how the B-G Finisher saves truck time, minimizes rolling and reduces the size of crew. Investigate today!

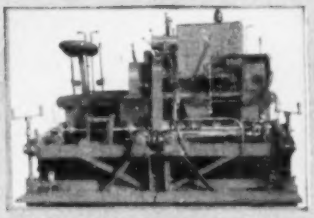
see your **B-G distributor** ...or write

features that mean

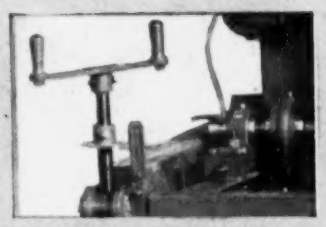
MATCHLESS PERFORMANCE



DUAL CONTROLS permit operation from either side depending on whether operator is matching a joint or following a guide line. Unobstructed view of mat edge. Foot-operated levers for feeding to spreading screw.

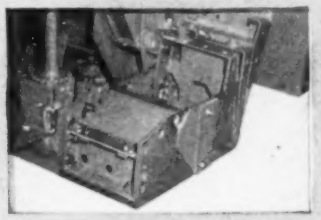


HEATED SCREED. For starting cold machine and maintaining temperature in cold weather, facilitates handling of materials not possible by any other method. Hot air blast with adjustable deflectors give safe, effective heat.



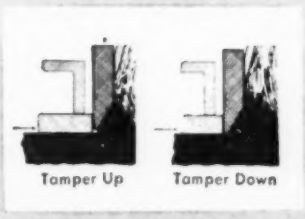
MAT THICKNESS CONTROLS. To change thickness, control tilts screed which gradually rides to a higher or lower level. There is no sudden change of mat thickness regardless of subgrade variations.

CUT-OFF SHOES of 1 and 2-foot widths are standard equipment. 10-foot standard width can also be reduced to 8 feet in 3-inch increments. Shoes can also be used with accessory extensions for reducing width.

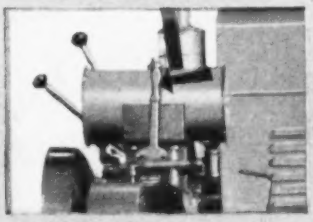


ONE-FOOT EXTENSIONS, added to either or both sides of standard 10-foot screed, increase laying width to 14-foot maximum. Cut-off shoes, left, adjustable in 3-inch increments, permit reducing mat to 12 feet without removing extensions.

ADJUSTABLE HOPPER GATES in 5-ton hopper plus individually operated feeders permit controlling the amount of mix reaching spreading screws and keeping the mix in motion. Three gates are quickly adjusted.



SYNCHRONIZED TAMPER—1200 strokes per minute—assures uniform density of mat compensating for subgrade variations. Reduces rolling.



POWER HOIST raises rear unit for traveling or maneuvering. Hoisting lever on top of machine is readily accessible from either set of controls.

WRITE FOR BULLETIN

Get the full story. A booklet completely describing the B-G Finisher will be sent upon request.

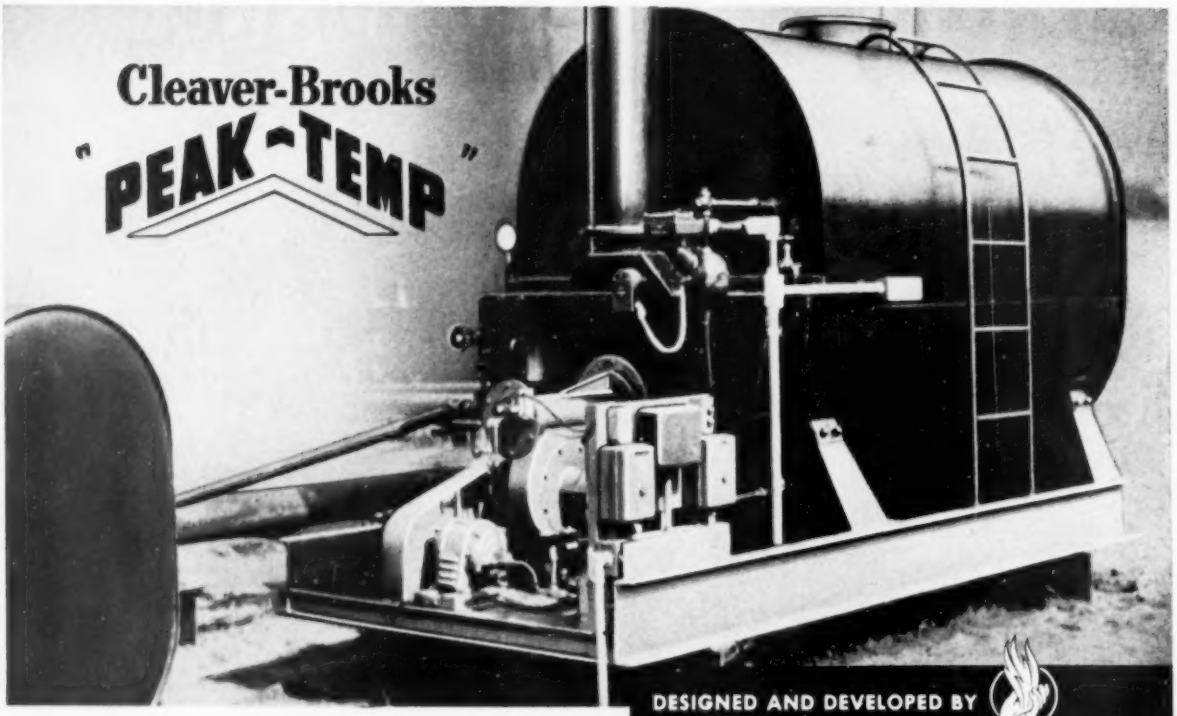
276

Barber-Greene

BG

Aurora, Illinois, U.S.A.

NEW Oil Booster uses high-temp oil as heat transfer medium — eliminates water, steam and pressure problems



DESIGNED AND DEVELOPED BY

Cleaver-Brooks

Builders of Equipment for the Generation and Utilization of Heat — Pioneers and Originators of Self-Contained Boilers, Tank-Car Heaters, "Deuce" and Bituminous Boosters

...gives you higher temperatures, faster, with lower fuel costs, less maintenance

"Peak-Temp" is the newest, quickest, lowest-cost way of heating oils, bituminous and heavy viscous materials in tank cars, storage tanks, bulk plants and refineries. By using a specially selected high temperature oil as the heat transfer medium, "Peak-Temp" gives you advantages never before possible in bitumin heating equipment. Look at this speed, economy and versatility!

HEATS TWICE AS FAST AS STEAM— "Peak-Temp" increases the temperature of bituminous materials at the rate of 25° to 30°F per hour. This is approximately twice as fast as with 150 lbs. of steam. Unit operates with oil at temperatures up to 600°F, without special pumps and fittings.

COSTS LESS TO OPERATE— "Peak-Temp" gives considerably more heat than steam unit using the same amount of fuel. What's more, "Peak-Temp" operates at atmospheric pressures, thus eliminating need for licensed engineer. Oil evaporation rate is very low. Users report 50 gallons or less of new oil need be added to system each season.

ELIMINATES WATER AND WEATHER PROBLEMS — "Peak-Temp" eliminates need for water tanks, water pipes, etc. Requires no special foundation. Heavy-duty base, plus self-contained readiness for fuel, electric hookup, simplifies installation. Heat transfer oil has pour point of approx. 5°F, and will not freeze under normal early spring and late fall operations.

"Peak-Temp" can make your bituminous materials handling a top efficiency operation — even on toughest heavy-duty jobs. Write direct for full information — ask for bulletin AD-108.

CLEAVER BROOKS COMPANY
Dept. K, 895 E. Keefe Avenue, Milwaukee 12, Wisconsin

Quick Facts on "PEAK-TEMP"

- ✔ **FULLY AUTOMATIC.** Operates on the principal of a closed heating system. Quick starts. Quick shutdown.
- ✔ **OIL and/or GAS FIRED** — low-pressure, atomizing-type burner.
- ✔ **SAFETY CONTROLS** — protect circulating system against low oil level.
- ✔ **MAXIMUM HEAT TRANSFER**—Exclusive "Peak-Temp" feature: Colder oil returned from circulating system is baffled to maintain best heat transfer efficiency.
- ✔ **SELF-CONTAINED** — includes pump, valves, piping, temperature and low-level controls, electric motors and controls.
- ✔ **AVAILABLE IN TWO SIZES** of stationary, electric-driven units: Series 1200—and Series 1800.

Make Budgets and Manpower GO FARTHER

with a HUBER MAINTAINER

There isn't a highway or street-maintenance problem in the nation that more dollars and more men wouldn't cure.

If either of these limitations is pinching you, don't overlook a few important facts about the Huber Maintainer:

1 It's a 6,000 lb., 42½ H. P. grader with attachments that convert it to a bulldozer, lift loader, mower, broom, snow plow, berm leveler, road planer or patch roller.

2 Its variety of uses keeps it busy every month of the year.

3 It gets around without haulage equipment—covers up to 100 miles in a day.

4 It costs less than half as much as many pieces of maintenance equipment.

5 It needs only ONE MAN to perform its many jobs.

HUBER MANUFACTURING CO. • Marion, Ohio, U. S. A.
Manufacturers of Huber Maintainers, Graders and Complete Line of Rollers

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ANOTHER ADVANTAGE OF BUCYRUS-ERIE

FOR SMALL-JOB PROFITS investigate Hydrocrane, the high-speed truck-mounted, all-hydraulic crane for jobs too small for larger machines. It can be quickly converted to a dragshovel right in the field.

Payloads...

INDIVIDUAL DESIGN

With Bucyrus-Erie Individual Design you get the smooth coordination of hoist, crowd, and swing that assures big payloads on every pass. The operator, working with easily manipulated, responsive controls, finds it easy to heap the dipper, easy to keep those big loads coming all through the shift.

That's because each machine in the Bucyrus-Erie ⅜- to 4-cu. yd. line is designed from the ground up to handle its rated capacity most efficiently. There are no oversize or undersize dippers used to make "different" models. With Individual Design, speed, power, strength and weight are all properly proportioned, and the machine works most efficiently as a whole.

See your Bucyrus-Erie Distributor soon. He'll show you the other great advantages of Individual Design — fast work cycles, low maintenance, long machine life, low operating costs. 20E53C

BUCYRUS-ERIE COMPANY
SOUTH MILWAUKEE, WISCONSIN

INDIVIDUAL DESIGN . . . for each model in the line

¾- to 4-cu. yd. gasoline, diesel, and single-motor electric
Shovels, Draglines, Cranes, Clamshells, Dragshovels —
Hydrocranes and Hydrohoes.

"Big Red"

Contractor completes job 45 days ahead of estimate as TD-24 fleet moves a million yards

Ryan Construction Company, Evansville, Indiana, took on a big job when they contracted to move a million cubic yards of dirt and place 35,000 tons of riprap in site preparation for a new steam generator plant on the Ohio River.

From the first day on the contract, Ryan's five TD-24's made the dirt fly. Their assignment: to cut down two hills and dump the excavated material in old creek bed to make a new power plant site.

They averaged 4 minutes and 40 seconds on the 2,000 foot round trip between cut and fill. Self-loading heaped

SWIFT SELF-LOADING A pair of hustling TD-24's charge ahead, self-loading 18 yard scrapers as they go. Five of these fast Internationals helped keep the job ahead of schedule.

TD 24 Rolls for Ryan

scrapers, the Big Red fleet moved tremendous yardages every day—kept doing it even in rain and mud, the Ryan people report.

TD-24's are the fastest and most powerful crawlers on the market. That's why "Big Red" performance is paying off not only for Ryan but for contractors across the country who need big crawler power to get tough jobs done on time.

And you can't beat the service provided by your nearby International Industrial Distributor. His trained servicemen, complete stocks of parts and up-to-date shop facilities are available to you anywhere, anytime to keep your equipment in production.

He and the famous line of IH crawlers he sells are willing and able to help you put your contract on a paying basis.

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILL.

POWER STEERING WITH FULL LOADS mean faster cycles, higher daily production. Because "Big Red" steers with full power on both tracks, it can maneuver with the same heavy loads that can be pulled on the straightaway.

WATCHING BIG RED ROLL Ryan Construction men keep close tabs on the performance of their five TD-24's. Cycles are clocked for half an hour every morning and afternoon. Left to right: Guy Tilley, Job Superintendent, Tom Vickers, Job Foreman, and Virgil Scales, Superintendent.

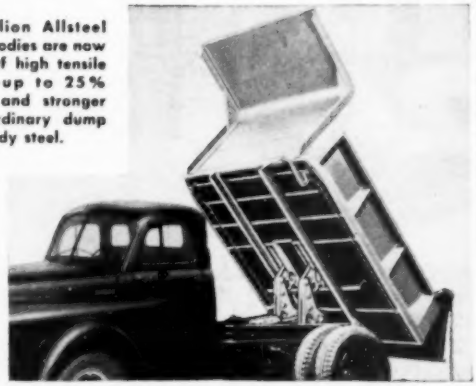
INTERNATIONAL HARVESTER

INTERNATIONAL

POWER THAT PAYS

DO YOU LIKE YOUR EQUIPMENT TOUGH?

All Galion Allsteel dump bodies are now made of high tensile steel—up to 25% lighter and stronger than ordinary dump body steel.



Galion Model 700 hydraulic hoist with Model 12 contractors' heavy duty body.

▶ If you need dump truck equipment that is built to take a beating day after day without downtime . . . that will work longer with less maintenance and operating cost . . . that you can be proud to own and operate . . . you should become a Galion user—right away!

▶ There's a standard Galion model to meet virtually every need of every contractor. But, if you need extra heavy duty units for jobs that are tougher than tough, Galion will be glad to design and build them to your specifications.

A-6129

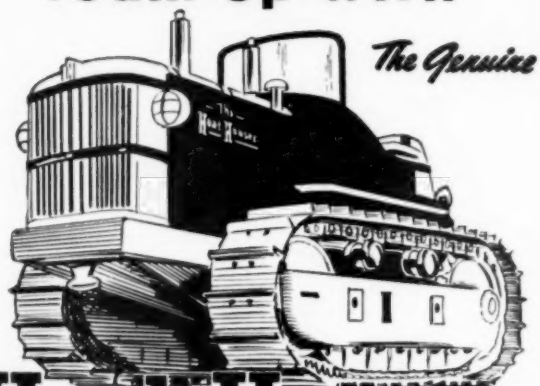
Just see your nearest Galion distributor—today!

THE GALION ALLSTEEL BODY COMPANY • GALION, OHIO

DON'T LET "WEATHER" CUT EFFICIENCY

team up with

The Genuine



Heat-Houser

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INDUSTRIAL

Why tie up your equipment and reduce the efficiency of the operator during cold weather? The Genuine HEAT-HOUSER manufactured from HEAVY DUTY, water resistant canvas is designed for maximum operator room and vision. Compact, one piece easily installed on most industrial type tractors; it will protect equipment and operator during those cold working days ahead. WRITE FOR COMPLETE DETAILS. THE COST IS LOW AND THE SERVICE HIGH . . . SPECIFY THE GENUINE HEAT-HOUSER . . . KEEP WARM WHILE YOU WORK.

SOLD THROUGH RECOGNIZED DISTRIBUTORS OF INDUSTRIAL EQUIPMENT

FORT DODGE TENT AND AWNING COMPANY
FORT DODGE, IOWA

DOW

DOWFLAKE SETS CONCRETE FASTER REGARDLESS OF THE TEMPERATURE

A DOWFLAKE admixture gives higher strength, speeds up production schedules, saves costly time and labor

Modern highway construction methods don't permit long wasteful periods of waiting for concrete to gain working strength. For this reason, the use of Dowflake® (Dow calcium chloride 77-80%) as an admixture is extremely important in reducing setting time.

At a temperature of 25°F. plain concrete requires six weeks to attain a strength of 2000 p.s.i. With a 2% addition of Dowflake, at the same temperature, only seven and one half days are necessary, *a saving in time of over 80%*. Naturally, with or without Dowflake, it is necessary to use heated aggregate, warm water, tarpaulins, etc.

At 70°F., Dowflake increases setting time 100%. And at every temperature, Dowflake gives concrete *greater strength*. Dowflake provides curing, too, by reducing the moisture loss during the early hydration period and by accelerating the hydration action while moisture is present. In addition to permitting faster, better work, a Dowflake admixture lowers time and labor costs.

Ask about Peladow®, Dow's new high-test, pellet-form calcium chloride (94-97%) also engineered for highway use. Write for detailed information today. THE DOW CHEMICAL COMPANY, Midland, Michigan.

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DOW

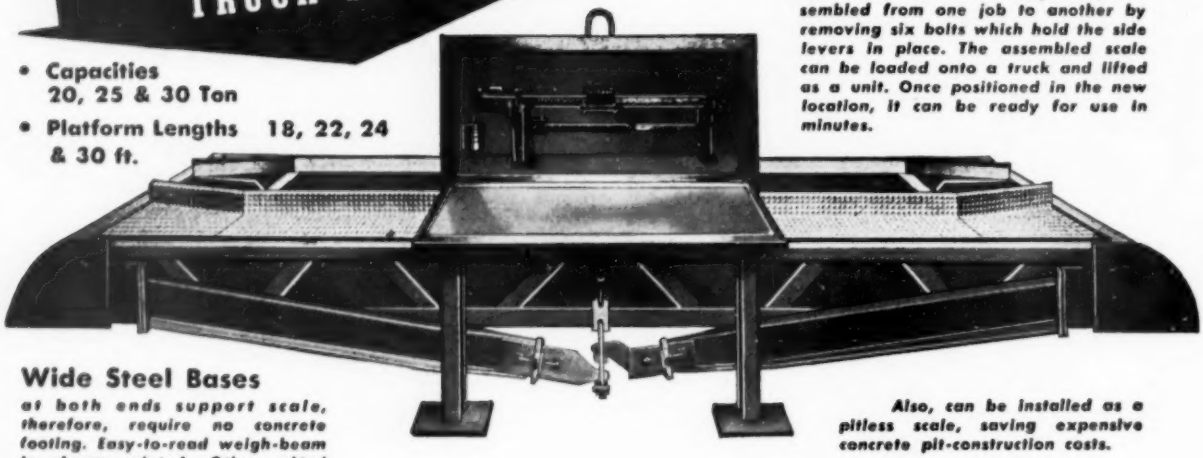
THURMAN PORTABLE TRUCK SCALE

THIS SCALE CAN BE MOVED FROM JOB TO JOB, AS A UNIT

- **Capacities** 20, 25 & 30 Ton
- **Platform Lengths** 18, 22, 24 & 30 ft.

Accurate and Portable

This scale can be transported, assembled from one job to another by removing six bolts which hold the side levers in place. The assembled scale can be loaded onto a truck and lifted as a unit. Once positioned in the new location, it can be ready for use in minutes.



Wide Steel Bases

at both ends support scale, therefore, require no concrete footing. Easy-to-read weigh-beam is chrome-plated. Other vital parts electro-plated against erosion.

Also, can be installed as a pitless scale, saving expensive concrete pit-construction costs.

The Thurman Line Includes:

• Pit Scales up to 50-Ton capacity • Pitless Scales • Batching Scales • Liquid Weighing Scales • Wheelbarrow Scales • Warehouse Scales • This and other weighing equipment in sizes to fit your requirements

THURMAN MACHINE CO.

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Established 1918

156 North Fifth Street, Columbus, Ohio

For Easiest Snow Removal Specify BURCH-BUILT *Equipment*

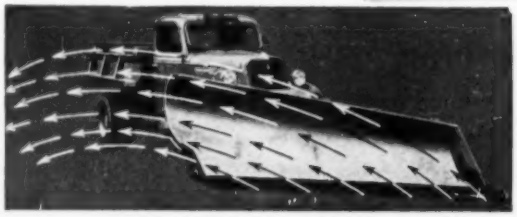
Features on "Burch-Built" ROSS Snow Plows which assure more efficient snow removal are:

1. Job-designed moldboard lifts, rolls, and ejects snow on a continuous flow. No dead weight—minimum resistance.
2. Wide push plate with reinforcing braces set parallel with line of plow travel.
3. Renewable reinforcing plate provides rugged strength where most needed. Bolted to push plate—protects edge of moldboard.
4. Tough, high-carbon steel cutting edges fastened directly to reinforcing plate gives an extra-rugged assembly.

BURCH-BUILT PRODUCTS FOR SNOW and ICE CONTROL

- Ross Snow Plows
- "V" Plows
- One-Way Plows
- Quick Safety-Trip
- Snow Wings for trucks and graders
- Sand and Salt Spreaders for ice control

Write Dept. R-93 for literature.



ROSS OFF-SET DESIGN ELIMINATES SIDE DRAFT

Thrust is equally distributed at both sides of moldboard, thereby allowing easy steering in deep snow. Conical shape of Ross moldboard offers least resistance in compact snow.

The BURCH Corporation

CRESTLINE, OHIO, U.S.A.

MANUFACTURERS OF EQUIPMENT FOR CONSTRUCTION AND MAINTENANCE OF ROADS AND STREETS

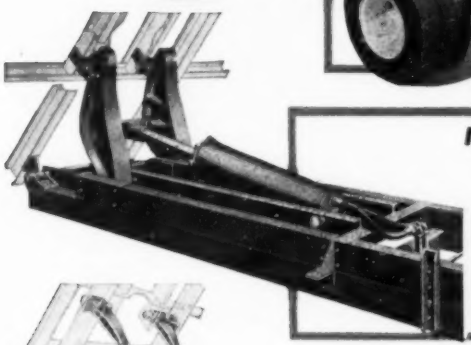
A Complete Line of PERFECTION HOISTS

for every Make and Model Truck

All parts of PERFECTION Hoists — pumps, power take-offs, and cylinders are engineered and guaranteed by PERFECTION. Each part is carefully inter-designed with all other parts, to produce units of exceptional efficiency, power, and dependability.

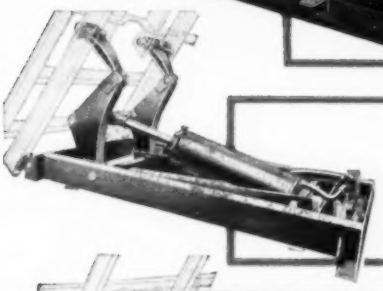
Model 7780 Telescopic

3-stage, telescopic, dual cylinder design provides tremendous lifting capacity with least weight, simple construction, and smooth operation. Direct upward lift is applied at the center of the load. For mounting on trailers with bodies up to 30 cu. yard capacity. Extra heavy-duty service.



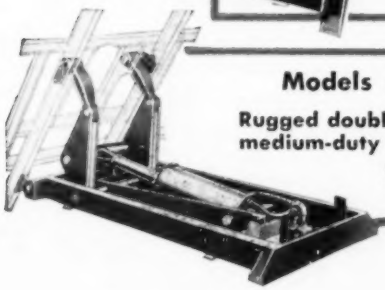
Models 727 • 827 • 1027 • 1034 Roll-A-Lift

A constant-low-pressure-type hoist that develops tremendous lifting capacity in relation to its piston displacement. Engineered for those jobs that require a rugged and powerful hoist. Four standard models cover body capacities from 6 to 20 cu. yards. Heavy-duty service.



Models 725 • 820 • 825

Compound-type, double lift-arm design, for medium and heavy-duty service. Three standard models for body capacities of 6 and 7 cu. yards.

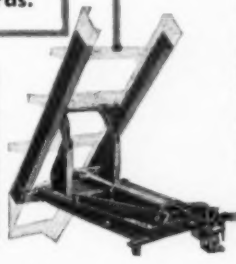


Models 615 • 715 • 715L • 720

Rugged double lift-arm hoists for light and medium-duty service. Four standard models cover body capacities from 1½ to 6 cu. yards.

Models 615B 715B • 720B

Low-mount, double lift-arm hoists for mounting with medium and heavy-duty platform and stake bodies. Three models for bodies from 9 ft. to 16 ft. long.



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TRUCK BODIES and HYDRAULIC HOISTS

THE PERFECTION LINE

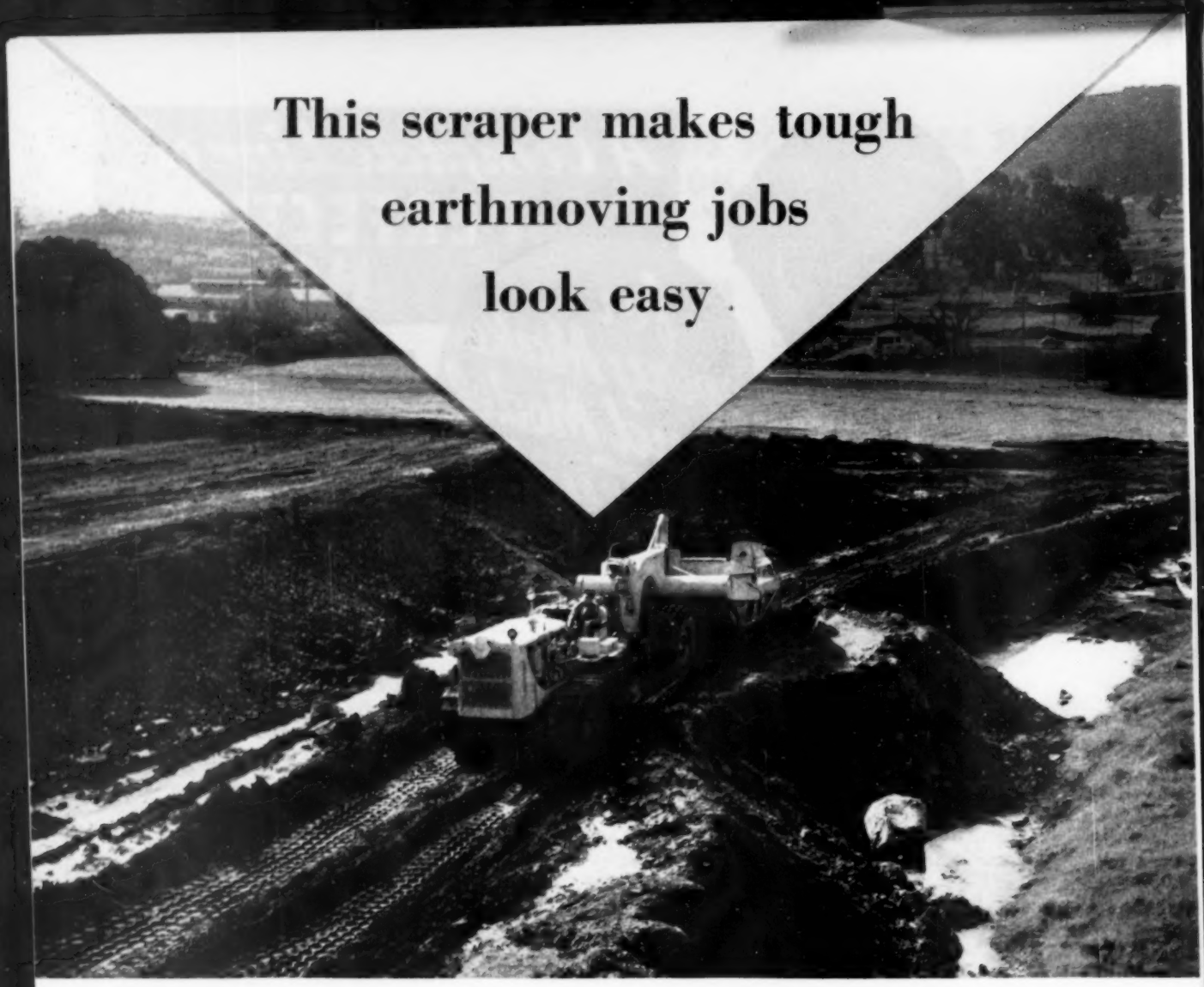
STANDARD and SPECIAL UNITS IN ALL SIZES — FOR ANY USE

Engineered, Manufactured and Guaranteed by

THE PERFECTION STEEL BODY CO.

Dept. R-93, Galion, Ohio, U.S.A.

This scraper makes tough earthmoving jobs look easy.



WORKING on a contract that called for moving 395,000 cubic yards of rock and clay and grading a 70-acre industrial site in 5 months' time, J. O. Archibald of Redwood City, California, needed rugged equipment with plenty of power and capacity. The terrain was half hill and half swamp. Fourteen Caterpillar Diesel Tractors, with Bulldozers and Scrapers, were used in completing the contract, for Mr. Archibald believes in standardizing on big yellow equipment. But he found one of the most efficient units for this type of job was the Cat* D8 Tractor-No. 80 Scraper combination.

The flat-bottom No. 80 is a brute for work. It handles 20 cubic yards heaped on every swing. Positive cable controls permit easy, accurate control of digging and spreading. Big tires give ample flotation in soft ground, and make hauling smooth. The push-plate, extending well back of the tires, allows in-line power for the pusher.

The surest way to *prove* what the No. 80 Scraper can do for you is to see it in action on your own job. Your Caterpillar Dealer will gladly arrange a demonstration. Call him today.

Caterpillar Tractor Co., Peoria, Illinois.

CATERPILLAR*

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NAME THE DATE... YOUR DEALER WILL DEMONSTRATE

Roads and Streets in the News

Nation's Press Sees Roadbuilding as Key Business Factor

The growing importance of highway construction as a factor in maintaining a high business volume is noted frequently in the Nation's press these days. Here are a few recent excerpts:

• The rise in value of construction work done, reported at an all-time high of $3.3 billion for July, was credited principally to highway construction by *Newsweek* in its "Business Trends" page for August 10.

• Elsewhere in this same issue, *Newsweek* quotes Secretary of the Treasury George M. Humphrey: "There are such things as hospitals, schools and highways which need to be built and improved." This remark was in connection with a discussion of steps which could be taken to cushion a recession if one should develop.

• The swift rise of toll turnpike construction was the subject of a front-page feature story in the *Wall Street Journal* for August 10. This report sums up activities on many fronts, and notes that the 300 miles of completed pikes existing in 1949 have now stretched to 900 miles, with another 1,000 abuilding. It credits the huge registration of autos and trucks —up 24 million since 1944 to a present high of 54 million—as the pusher, with the financial success of completed turnpikes as the accelerator of this program.

• Another advocate of a drastic increase in expenditures for public works, notably for highways, as an anti-recession measure, is Dr. Arthur F. Burns, chief economic adviser to the President. Quoting the Joint Committee on the Economic Report he cites the $43 billion backlog of highway construction work needed to bring the road system up to modern standards. "Therefore," he said, "it is obvious that any substantial decrease in defense expenditures can and should be replaced by federal expenditures for roads and streets." About $6.5 billion in federal, state and local highway projects are already in an advanced stage of planning, according to Mr. Burns.

• *Time* magazine for August 10 gave prominent attention to a major national headache in the article, "Trucks on the Road—How Much Should They Pay?" The article quoted ex-commissioner Thos. H. MacDonald's estimate that 75,000 miles of the Nation's main highways are in critically deficient condition, and that "we are falling behind in their rebuilding at the rate of 5,000 miles a year."

This summary, incidentally, suggests that it is time for the trucking industry to "face the fact that its own future lies in a constructive approach to the highway problem," including that of weight and size regulations.

Sale of Euclid to GM makes national headlines

The recent acquisition of Euclid Road Machinery Co. by General Motors Corporation was the subject of comment by *Time*, which notes that this deal involving $18.3 million is a "handy economic anchor to windward." In any recession one industry that is sure to boom is roadbuilding, sparked by federal and state aid, noted this publication whose editors have become increasingly road conscious.

The GM-Euclid tie-up is in line with a trend represented in recent months by the purchase of LeTourneau by Westinghouse, LaPlante-Choate and Buda by Allis-Chalmers, Hough by International, and similar deals.

State "Par" groups plan new good roads push

The Project Adequate Roads movement, known as "PAR," organized a year ago, is to gain impetus this fall with a highway promotion program in each of the 48 states.

Executives in the national Project Adequate Roads organization and leaders in newspaper, radio, TV and advertising work were scheduled to meet August 27 at White Sulphur Springs, W. Va., to map out publicity campaigns in the 48 states.

The immediate purpose is to form an Adequate Roads Information Council and to devise means of stimulating a highway information program. Following this meeting steps will be taken to form information committees in all states. These committees will include representatives of highway users, highway commission officials, and prominent citizens. The state committees will be advisory in nature, it is understood, and one of the objectives will be to further the application of sufficiency rating studies and other techniques to determine highway needs and devise a "first things first" roadbuilding program commensurate with traffic demands.

Chairman of the publicity project is Clem D. Johnson, vice-president of the Chamber of Commerce of the United States. The PAR organization heretofore has been in the formative state under a temporary operating committee consisting of L. S. Westcoat, Chairman, American Petroleum Institute; Albert Bradley, Executive Vice-President of General Motors; and Arthur M. Hill, Chairman of the National Highway Users Conference.

Billion in arterial road work initiated during January-June period

A total of $1,084,512,000 in highway contract awards and force-account initiation was reported by state highway building agencies for the period January through June, 1953, according to a Bureau of Public Roads compilation. Involving 7,001 projects on 23,885 miles of road, these jobs include those financed with and without federal-aid participation, the latter comprising only 55 per cent of the projects largely because of toll road activity.

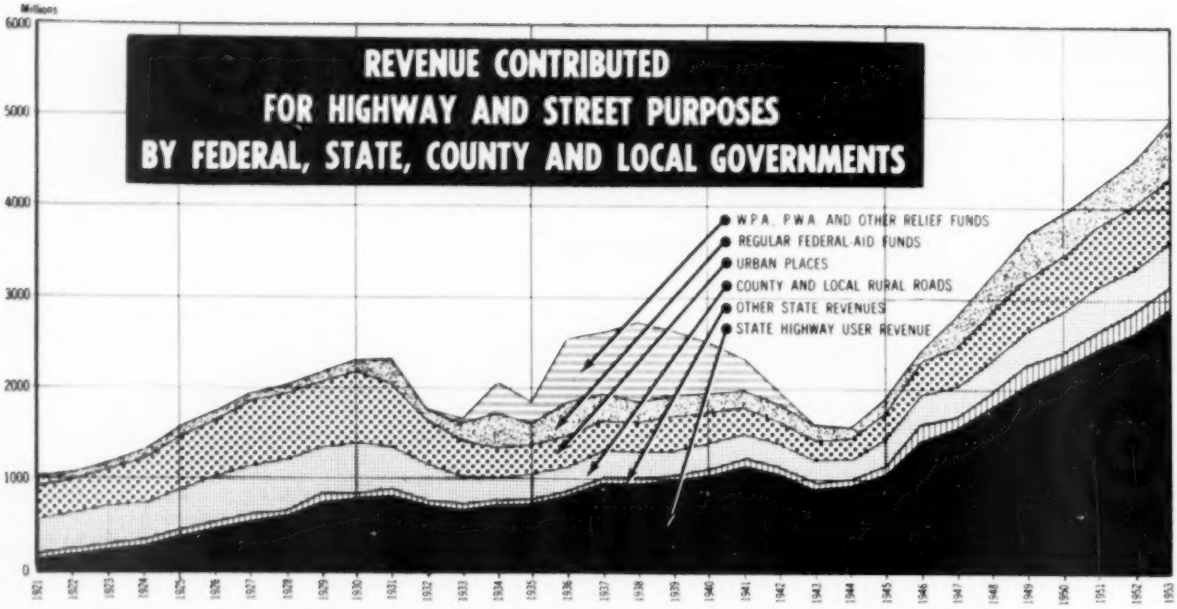
The sum represents contracts awarded, force-account work authorized, and includes federal-state, federal-state-local and state-local cooperative projects, in addition to a small amount of work by the federal government in the national parks and forests.

The sum includes contract awards totaling $231,093,000 for special toll facilities for the period, as follows:

California, Richmond-San Rafael Bridge $35,334,000; Indiana, Lawrenceburg Bridge $4,347,000 and Wabash River Bridge $2,239,000; Mississippi, Gautier-Pascagoula Bridge $5,959,000; Missouri, Pasco Bridge

Road Building Volume Up 10%

Road construction expenditures in 1953 will be 10.1% ahead of 1952, says a joint forecast by the Building Materials Division, Department of Commerce, and the Bureau of Labor Statistics, Department of Labor. Road volume was up 5.4% the first half, will spurt 13.1% the second half.


Millions
6000
5000
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REVENUE CONTRIBUTED
FOR HIGHWAY AND STREET PURPOSES
BY FEDERAL, STATE, COUNTY AND LOCAL GOVERNMENTS
W.P.A., P.W.A. AND OTHER RELIEF FUNDS
REGULAR FEDERAL-AID FUNDS
URBAN PLACES
COUNTY AND LOCAL RURAL ROADS
OTHER STATE REVENUES
STATE HIGHWAY USER REVENUE
1921 1922 1923 1924 1925 1926 1927 1928 1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1940 1941 1942 1943 1944 1945 1946 1947 1948 1949 1950 1951 1952 1953

★ Roadbuilding volume trends are visualized by this chart which covers tax funds but not bond proceeds. Total for 1953 expected to exceed $5.5 billion including toll projects. Courtesy National Highway Users Conference

$10,615,000; New Jersey, Garden State Parkway $63,143,000 and New Jersey Turnpike $934,000; New York State Thruway $166,797,000, Port of New York Authority $1,988,000, and New York Lincoln Tunnel $1,016,000; Ohio Turnpike $23,801,000; Pennsylvania Turnpike System $16,835,000; Washington State Toll Bridge Authority $1,051,000; and West Virginia Turnpike $47,151,000.

The billion dollar total includes 117 force-account projects at $4,295,000 involving federal aid, and 1,998 force-account projects totaling $26,533,000 without federal aid.

Roadbuilding volume still rising; new peak foreseen

(See Above Chart)

The accompanying chart, prepared by the National Highway Users Conference, gives an interesting picture of highway and street construction and maintenance during the past third of a century.

It fails to visualize several things. One is the effect of inflation, which has halved the value of the dollar in the last decade. It excludes road work based on borrowings, and therefore doesn't include toll roads, bridges and tunnels, which would be represented by a new layer beginning since the last War and gradually thickening.

Road and street funds including these omitted sources are expected to total over $5.5 billion from all sources in 1953. Toll project awards for the present year will total about $500 million, with actual expenditures somewhat below this figure due to the time lag.

Colorado road work hits record pace

In the first seven months of 1953, the Colorado Department of Highways set a new road building record for the period, according to Chief Engineer Mark U. Watrous.

As of July 31, this program consists of 117 projects covering more than 840 miles and amounting to more than $16,300,000. The bulk is represented in 57 major construction projects covering approximately 300 miles on virtually every Federal Aid Primary and Secondary Highway in the State.

Included also are 41 projects covering 440 miles through agreements with various counties and by State forces; Twelve projects in the State oiling program covering 109 miles; and Seven projects for traffic signals, signs and similar work.

Consultants say "Yes" to Virginia toll road

Consulting engineers have reported to Virginia State Highway officials that there is sufficient traffic in the Richmond-Petersburg area to justify the construction of a north-south toll road. Of five lines analyzed during a study which began last fall, two routes, one "rural" and one passing through Richmond and Petersburg, were found to be most feasible.

Of the rural routes, the engineers said a line which skirts the highly developed areas to the north and east of Richmond and passes between Petersburg and Camp Lee provides the best solution to the traffic needs of the area. However, a comparison with the benefits from a route through Richmond and Petersburg raises serious doubt as to the wisdom of constructing the rural facility. The city route, the engineers stated, will most effectively meet the demands of through traffic and also furnish greatest service to local traffic.

These conclusions were contained in a report presented to Highway Commissioner James A. Anderson by Wilbur S. Smith, of New Haven, Conn., whose firm made the study.

The rural line favored connected U. S. 1 and 301 north of Richmond and 460, 301, and 1 south of Petersburg. This route, 40.7 miles long, would cost an estimated $51,394,000.

The city line, 35.3 miles long, passed through Richmond and Petersburg and generally paralleled present U. S. 1 between the two municipalities. It joined U. S. 1 and 301 north of Richmond and 1, 301, and 460 in the Petersburg area. Estimated cost $57,252,000.

Warrick co-chairman joint AASHO-AGC committee

W. A. Warrick, Chief Construction Engineer of the Pennsylvania Department of Highways, has been appointed Co-Chairman of the Joint Cooperative Committee of the American Association of State Highway Officials and the Associated General Contractors of America. He succeeds C. M. Hathaway, Consulting Engineer, Illinois Division of Highways.

Mr. Warrick together with George Koss of the Koss Construction Company of Des Moines, Iowa, representing the contractors, will conduct the meeting of the Committee which has made much progress on the various

aspects of highway engineering and construction.

Regional meetings of the Committee were scheduled recently for Asheville, North Carolina, and Santa Fe, New Mexico, in October.

Tolls proposed for Chicago expressways

A pay-as-you go plan involving tolls is being considered by Cook County highway officials, as a means of speeding up the construction of the expressway system that will ultimately network Chicago and environs. These badly needed facilities are now under construction as free routes with Chicago city, county, state and federal tax funds plus bond proceeds, but the rate of completion has been painfully slow and current funds are being depleted.

The plan was proposed to the Cook County Citizens' Advisory Committee by William N. Erickson, Cook County board president. Tolls would be collected on four main routes leading from the downtown "Loop." These are the Northwest Highway which ultimately will lead to O'Hare Airport and connect with existing Edens Parkway on the Northwest side; Congress Street now under construction to the West Side; the proposed Canal Expressway to the southwest side; and the proposed South Expressway tieing in with the partially built Calumet and Tri-State parkways on the far south side.

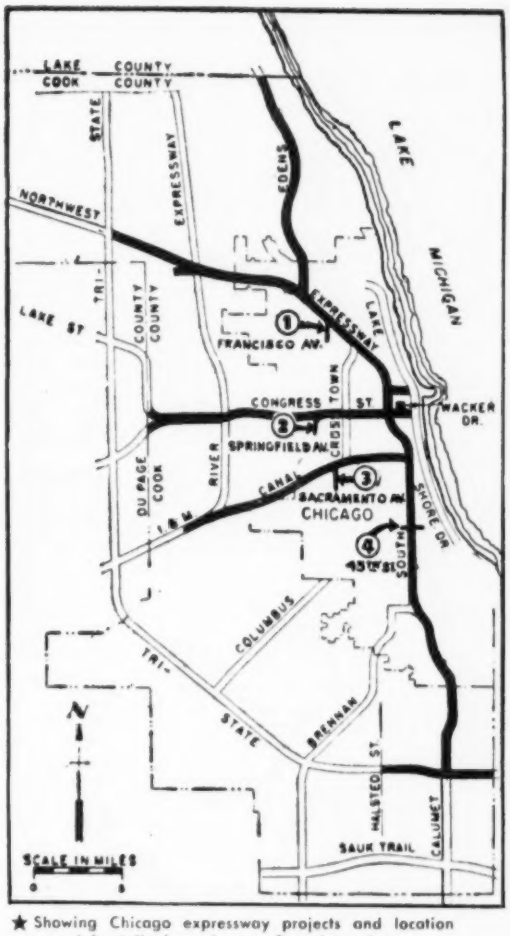
In presenting the study to the committee newly-appointed county highway superintendent William J. Mortimer stressed the fact that the county has only enough money left to complete Congress Street and the Calumet Expressway and buy a small part of the right of way for the Northwest route. The entire program would virtually come to a halt unless new financing methods are found.

Toll stations would not be built at termini or interchange points, as is the custom with rural toll turnpikes. One toll plaza would intercept the main traffic stream approximately midway along each of these radial commuter routes. A 25-cent toll charge is proposed. Vehicle owners not wanting to pay this toll would have the alternative of leaving the expressway at some access point before reaching the toll both, and if they desire, of detouring and coming back onto the expressway via side streets. The detour in the various instances would take from five to eight minutes, and involve additional travel distance, compared with about one minute to traverse the equivalent expressway segment.

In discussing the plan Mr. Mortimer said, "Experience in New York City with similar toll facilities has shown that only one-half of one per cent of the drivers leave the expressway to avoid payment of tolls. There, they have only a four block detour. Our survey shows that if we were to charge a 10-cent toll (on each of the four expressways), annual revenues would amount to $11,360,000, while a 25-cent toll would yield $28,310,000. If toll roads would attract only 60 per cent of the traffic that would use a free highway, the 25-cent toll would still bring in $16,986,000 annually."

"If we figure an operating budget for administration, toll collection and maintenance of $1,500,000 per year, it would leave $15,486,000 annually which would retire a bond issue of $229,000,000 sufficient to construct 19 miles of expressway," Mr. Mortimer further explained.

The citizens committee pointed out that tolls should be collected on all major expressway routes, if on any one, as the only equitable method equally fair to motorists residing in all segments of the Chicago area.



★ Showing Chicago expressway projects and location proposed for toll plazas in new financing scheme

Mass transportation theme of ASCE convention

Some 150 technical papers, covering thirteen areas of engineering activity, research and development, will be presented at the American Society of Civil Engineers annual meeting, Oct. 19-23, Statler Hotel, New York City. Mass transportation, a burning problem for New York's millions, will be the emphasized theme, with five sessions on that subject. An attendance of 3,000 is expected.

Bertram D. Tallamy, Chairman of the New York State Thruway Authority, will be the principal speaker at a luncheon, Oct. 19, of the Society's Highway Division.

President Walter L. Huber, of San Francisco, will open the meeting. New officers will be installed; the official nominee of the Board of Directors for President is Daniel V. Terrell, of Lexington, Dean of the College of Engineering of the University of Kentucky.

Several engineers will receive honorary membership, the Society's most distinguished honor. Awards will be made for outstanding papers published by the Society in the preceding year.

An excursion Oct. 23 will take members and guests to the Fairless Works of the United States Steel Corp. at Morrisville, Pa. A post-convention inspection trip will be made to Kindley Air Force Base, Bermuda.

Pennsylvania Turnpike Traffic Hits New Peak

Traffic and revenue on the Pennsylvania Turnpike System hit an all-time high during the month of July, according to Thomas J. Evans, chairman of the Pennsylvania Turnpike Commission. A total of 1,347,443 vehicles used the system during the 31-day period and paid $2,366,690.25 in tolls.

The closing week-end of July brought the Turnpike more traffic than at any time in the road's 14-year history. From Friday morning until Sunday midnight, more than 200,000 vehicles used the system. Traffic on Sunday, biggest day, included 68,000 vehicles using some part of the 327 mile system.

How City Engineer and Police Cooperate to

Keep Minneapolis Winter Traffic Moving

Keeping streets and alleys clear in winter cost the City of Minneapolis nearly $500,000 last year, and required over 300 equipment units. Here is the detailed plan of operation involving cooperation between plow crews, police, newspapers and radio stations.

By Hugo G. Erickson

City Engineer, City of Minneapolis, Minnesota

AN EARTHMOVING outfit is considered pretty good, even these days, when it moves 8,500 cubic yards per day. This is about the yardage we load into trucks and haul away every night in downtown Minneapolis, following a snowfall.

Merely opening up the streets in the central business district with truck plows has long since ceased to suffice. Today, disposal is our chief problem, along with the twin headache of parked or stalled vehicles. Vacant property, parks and sewers are used for snow disposal in the residential areas. But such facilities are not available in the Loop area, due to the distance involved and the large amount of snow handled. Over 1,000 truck loads per night is our normal schedule when we have a job to do. The snow is thrown into the Mississippi River bordering the Loop.

The snowloading and dumping cycle is as follows: The snow is loaded into trucks by conveyor loaders supplied by one of the four loading crews. The snow is trucked to a large bridge spanning the river, and the load dumped on the deck. A large rotary snowplow throws snow into the river.

Even though this operation results in a double handling of snow, the method has increased our production about 30 per cent over dumping directly into the river from a snow dump. Dumping on the bridge for re-handling is faster, safer, easier on equipment. It provides a larger area for simultaneous dumping of trucks.

Minneapolis doesn't use rotaries for loading in the streets, primarily because so many conveyor-type loaders are available. Rotaries are used, however, for throwing snow onto parkways, center islands and other adjacent property along outlying streets. Small tractor-mounted rotaries are used to clear city-owned sidewalks, walkways on bridges, etc.

The winter parking problem is serious with us, as with all northern cities. No ordinance automatically restricts parking because of a snow condition; parking can be restricted effectively only by *posting the streets* with "No Parking" signs. In addition to signs, a list is published giving the streets scheduled for snow removal each night. The daily newspapers and radio stations cooperate very well on this detail and on general publicity helpful in our winter public service job.

Snow removal costs have been mounting, due to many factors including inflation, population growth, increase in traffic, and the demand for constantly better service. Costs for the past three calendar years are as follows:

Year	Amount of Snowfall	Cost
1950	73.0 inches	$366,000
1951	86.4 inches	355,000
1952	67.0 inches	490,000

Readers will be interested in how we deploy our fleet, which is itemized in the accompanying table.

All equipment is owned and operated by the city; it is seldom necessary to rent outside equipment. Bids are taken annually for the use of private equipment to supplement city equipment. This is done, however, before the season starts, so it is not an emergency matter.

Each of the five residential Street Division Districts normally uses 15 to 20 trucks and plows, 2 sand spreaders, 2 to 3 motor graders, and 2 front-end loaders. The Downtown District uses 15 trucks and plows, 10 to 15 motor graders, 2 front-end loaders, 4 or more conveyor loaders, 2 sand spreaders, one salt spreader, 2 large rotary plows, etc.

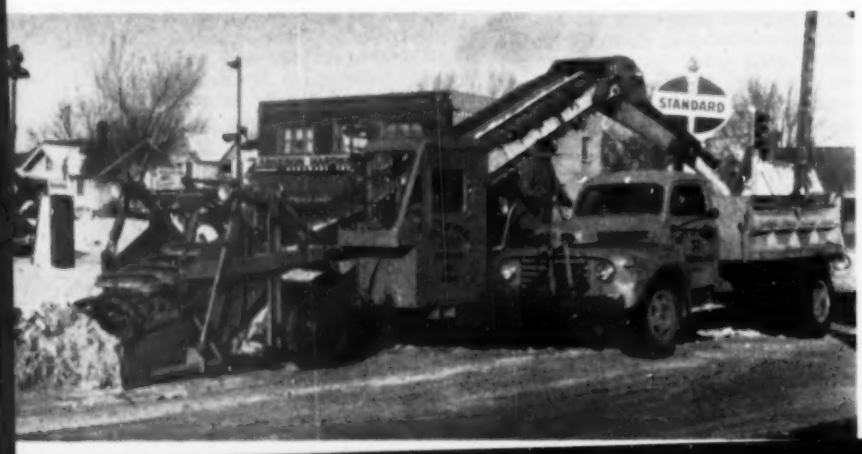
All equipment is shifted around to meet requirements. For example, the Downtown District normally uses most of the dump trucks for night snow removal in the Loop area.

General Snow Plan

With these quick highlights, let us review our basic plan of operation for a snowstorm which is as follows:

Immediately after the snow has stopped falling or there is an accumulation of six inches, with the absence of high winds, we immediately start plowing our city streets.

★ Windrow loaders help dispose of large tonnages of snow and loosened ice from Minneapolis congestion points



★ Two-way radiotelephone essential tool of winter street management

★ Small mobile front-end loaders are of growing importance in winter traffic maintenance. Shortage of adequate disposal locations is a problem

Upon completion of plowing, we load, haul and dispose of the snow in the Central Business District, the practice being to fan out from the central section to the outlying areas.

Also, after our plowing operations have ceased, we load, haul and dispose of snow from community business sites. As a rule, this operation consists of removing the snow from areas a block or two immediately adjacent to places of business. Alleys are plowed after the street plowing is completed.

No effort is made to regulate traffic during the first snowplowing operation. Appeals are made on the radio requesting that cars be kept off the streets to be plowed. We have a thousand miles of streets. A 10 to 14 inch snowfall will take about 12 hours to plow out, the plowing operation being continued without interruption until the job is completed. A plan for the sequence or schedule of plowing is in effect; each street and avenue has its authority; each route has a number with a definite assignment of equipment.

Downtown Details

The snowplowing operation in the Central Business District involves close cooperation with the Police Department. In the fall of the year and during the winter season, we hold frequent conferences with the police officers, including inspectors, captains, and officers in charge of the various precinct stations. These conferences are in the form of seminars and critiques and we discuss the shortcomings of our operations, both from the police standpoint and the Engineer's standpoint in the snow removal operations, and methods or innovations or remedial measures which may be taken.

Snow removal work in the Central Business District is carried on between 11:00 P.M. and 7:00 A.M. Each day our Superintendent of Streets posts a schedule upon which street he expects to work that evening. This list is sent to the Police Department, Traffic Division, and precincts involved by noon of the day preceding the snowloading operation.

The City Engineer then with his crews "posts" all streets on which the operation is to be carried on, doing this by 4:00 P.M. This consists of placing five, six or up to ten signs in each block stipulating "NO PARKING 10:00 P.M. to 8:00 A.M.—SNOWPLOWING." These paper signs are nailed to lathes and stuck in the snow windrows resulting from the preceding blading operation.

After the night watch of the Police Department has reported, officers go over the "posted" streets and see that they are properly marked. The man from the Engineering Department placing the signs notes the time that he placed the signs and also the number of signs he placed in each block. The police officers immediately call our Street Department if they feel that insufficient signs are placed and steps are taken to remedy this deficiency. At 10:00 P.M. in the evening the Police Department commences enforcing the NO PARKING ban. They tag all cars illegally parked and notify towing companies of the location of parked vehicles.

Police Cooperation

The towing work in Minneapolis is done under contract. The towing contractor immediately starts towing away and impounding cars illegally parked when notified by the Police Department. This plan has been coordinated to the extent that the towing operation begins where snowloading is to start and follows in the same general pattern the snow removal work is expected to follow.

It will be noted that considerable care is taken to have information regarding the placing of the signs, time, location, number, and also a check made by the Police Department as to the adequacy of the posting, so that if violators complain or plead not guilty in the Courts, adequate evidence is on hand to refute their statements. The violators are fined five dollars for illegal parking; also, they must pay the cost of impounding and any rental fee that might occur due to the car being kept in storage. As a rule, the gross bill is approximately fifteen dollars. This plan has worked out very well. There is of course a considerable hue and cry from the violators but they do not receive any sympathy. The press of our city has been very cooperative in giving us support.

At the time the City Engineer sends out his list of streets upon which he is to operate, he also sends a copy of this plan to the newspapers. They in turn publish the list of streets upon which the snowplowing and snowloading operations are to take place and the warning that "no parking" regulations will be enforced.

★ Pairs of motor graders with scarifiers loosen ice and work it to the gutter

★ This arterial street now well cleared and equipment soon freed for clean-up work

Minneapolis City-Owned Snow Removal Equipment

DUMP TRUCKS	110	Cedar Rapids Snow Master	1
Truck plows	110	Small tractor mounted Rotary plow	3
Mechanical sand spreaders	12		
Mechanical salt spreaders	1	CONVEYOR LOADERS	
		Fox	4
MOTOR GRADERS	25	Barber-Greene	2
		Athey	2
FRONT END LOADERS			
Hough HR. (four wheel drive)	4	JEEPS with snowplows	7
Hough HF (two wheel drive)	4		
Moline UTIL & Lull Loader	2	OTHER equipment when needed	
		Front end loader (Crawler)	4
ROTARY PLOW		Bulldozers	5
Bros Mg. AL 275	2	Miscellaneous tractors	10

In the period that night work is being carried on in the Central Business District, cleaning operations are taking place in the outlying districts during the day. Snow is removed and hauled away from approximately a hundred miles of streets. The same sort of procedure is used for "signing" in the outlying districts as in the Central Business District.

Clean-up Follows

During the period immediately following the snowfall, and while the loading operations are taking place, both in the Central Business District and in the outlying districts, a cleanup is being carried on. This constitutes pushing back the snow and widening, cleaning out the crosswalks and intersections and plowing back the snow where vehicles have been parked when the first plowing operation took place.

The city plows about 3000 alleys after a snowfall but no restrictions are enforced as to parking in that instance.

The methods that I have outlined for cooperation between the City Engineer's Department and the Police Department to facilitate the snowplowing and loading operations have worked out very well.

To illustrate, in February and March of 1953, as a result of approximately 90 inches of snowfall during the season, and no thawing, there were huge windrows or banks of snow along the plowed streets. This condition restricted the width of the streets and seriously impeded traffic. Under the blanket type of authority given the City Engineer, he then posted NO PARKING provisions where such conditions prevailed, thereby making it possible for the streets to carry the necessary traffic.

★ Outlying streets bring high-speed equipment into play

• **W. Vance Baise,** state highway engineer of North Carolina, 1943-49, and more recently general manager of the North Carolina State Asphalt Association, died recently.

Meetings Ahead

NATIONAL HIGHWAY CONFERENCE OF COUNTY OFFICIALS — by American Road Builders Association, Lake Delton, Wis.; September 24-25

INSTITUTE OF TRAFFIC ENGINEERS — 24th Annual Meeting, Hotel Statler, Buffalo, New York; September 27—October 1

WESTERN ASSOCIATION OF STATE HIGHWAY OFFICIALS—32nd Annual Meeting, La Fonda Hotel, Santa Fe, N. Mex.; October 7-9

AMERICAN SOCIETY OF CIVIL ENGINEERS —Annual Meeting, Statler Hotel, New York City; October 19-23

AMERICAN BRIDGE, TUNNEL AND TURNPIKE ASSOCIATION, INC. — Annual Meeting, Park-Sheraton Hotel, New York City; October 19-21

AMERICAN PUBLIC WORKS CONGRESS AND EQUIPMENT SHOW — Municipal Auditorium, New Orleans, La.; October 26-29

AMERICAN CONCRETE INSTITUTE — Southwest Regional Meeting, Rice Hotel, Houston, Texas; October 29-30

ILLINOIS TRAFFIC ENGINEERING CONFERENCE — Sixth Annual Meeting, University of Illinois, Urbana, Ill.; November 3-4

AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS—39th Annual Meeting, William Penn Hotel, Pittsburgh, Pa.; November 10-13

AMERICAN ROAD BUILDERS ASSOCIATION —Annual Meeting, Chalfonte-Haddon Hall, Atlantic City, N. J.; January 11-13, 1954

CONSTRUCTION INDUSTRY MFRS. ASSOCIATION — Annual Board Meeting, Chalfonte-Haddon Hall, Atlantic City, N. J.; January 11, 1954

ASSOCIATED EQUIPMENT DISTRIBUTORS —Annual Meeting, Waldorf-Astoria Hotel, New York City; January 31-February 2, 1954

ASSOCIATED GENERAL CONTRACTORS OF AMERICA, INC. — Annual Meeting, Statler and Biltmore Hotels, Los Angeles, Calif.; February 26-March 3, 1954

EDITORIAL

Good Inspection—More Important than Ever

By Harold J. McKeever

The other day this reporter drove past a state road widening job on which the workmanship was noticeably rough. New curbs and culvert headwalls weren't true. The new bituminous resurface was such as to worry the practiced eye. "The contractors around here are having a tough time getting experienced men," was the project engineer's explanation.

Sound familiar? The fact is that roadbuilding is booming at such a high rate along with other construction in some states, particularly near the big turnpike projects, that the old wartime problem of getting good work from contractors is still present. Contractors in these areas are loaded with jobs, and many an outfit that was 80 per cent on defense work is now 80 to 100 per cent on highway and bridge jobs. Some of these fellows who grew big on war work have shown a tendency to carry over into roadbuilding the laxities of the hurried defense-job days.

Contractors who are highly industry conscious today preach good workmanship in their association meetings, and are loud in seeking "results" specifications that throw the responsibility of workmanship more largely back onto them.

Highway building agencies, in turn, have more at stake in good inspection each passing year, as new refinements are found necessary to secure durable construction for heavier traffic. As costs per mile go up for modern heavy duty highways, the dollar value of getting quality construction is accentuated.

Contractors and engineers could do a better job of getting together and talking over inspection. The problem, however, is primarily a top management one with the highway departments. Good workmanship is achieved when the whole atmosphere of the highway department's program is pervaded with an intense zeal to get the work done in a manner to be proud of, and still without unnecessary frills. This may require the stepping up of off-season training and of office-field liaison. It will probably mean raising the quality level on some details from that heretofore prevailing.

The inspectors as well as project engineers are important men. Every effort should be made to upgrade their classification and pay and to secure good men in competition with industry. More important even than engineering judgment and familiarity with specifications on their part are their attitudes. The day is past when the inspector can afford to think of himself primarily as a policeman or antagonist, pitted against the wits of the foxy contractor. The best fieldmen look upon themselves as instructors or mediators, and as cultivators of good will and mutual understanding between the contractor's force and the engineers.

The highway department's principle reason for existence is to secure proper construction, when you come to think of it. Construction is the end-result of all the planning in behalf of the public to provide better transportation facilities.

Why Not "Box Seat" Rates for Curb Space?

Cities which are having a tough time financing street improvements should consider anew the opportunity of curb-lane taxation. Millions of automobiles are stored along the curbs of our streets, night and day. This privilege, if not free, seldom costs the owner more than the usual 5 cents per hour meter charge.

The curb position is the "box seat" of auto parking, noted an acquaintance of the Editor recently. In drawing this parallel, he pointed out that you pay six dollars for a box seat at the ball park, and fifty cents for a bleacher seat. In contrast, when you look for a place to park near your store or business, you pay fifty cents to a dollar to get into a crowded lot away down the street—the "bleacher" position, so to speak. But if you are lucky, you can pay a dime and park two hours right in front of your destination.

Guy Kelcey, New York consulting engineer, in advancing this point of view, urges that we begin treating curb space as box seats. He does so out of wide experience in metropolitan traffic and engineering problems. He is not alone in the trend of thinking toward seeking more revenue from curb parking. Robert Moses of New York City in his prize-winning General Motors contest essay advocates more widespread metering to help finance needed urban highway and street betterments.

At one time this Editor bemoaned the tendency to meter parking space for revenue purposes, since the meter was originally intended to help get "sleepers" out of store-front parking space and force a wider rotation or sharing of limited space for the benefit of local merchants.

This it has indeed accomplished. Meantime, traffic growth has brought acute new money problems to cities. Councilmen would do well to consider not only an expansion of metering near the stores, but also more widespread rental charges for curb storage in outlying districts and generally. They might study the setting of meters for dimes, quarters and even half-dollars in limited business areas; and consider perhaps a five dollar monthly rental charge and license tag deal for overnight curb space. Or is this politically too unpalatable?

IT COSTS LESS TO BUILD GOOD ROADS THAN TO HAVE POOR ROADS

Tractor-Mounted Drills Help Boost

★ The drill rig pictured below can be seen on far hilltop

★ Some of the nine wagon drills required to keep up with Savin's 4-yd. shovel at another location

AMONG the "heaviest" of the Thruway jobs are the two adjoining contract sections of Savin Construction Corporation north of Catskill, New York. Here the highway leaves the Hudson River valley and runs along the first bluffs or back through the hills, the two express roadways often being located at different levels and separated by jutting islands of untouched forest. Over 5,500,000 cu. yd. of excavation, some 50 per cent rock, constitutes the major item.

For clearing, chain saws were sometimes the only equipment larger than hand axes that could be brought in, due to the steepness of the slopes. Of particular interest is the methods used to clear and shoot 250,000 cu. yd. of rock from a 150-ft. hillside known as "Mushroom Rock." The procedure here, where the trees were relatively small, was first to clear and doze a path along the top of the bluff, for equipment access. Trees and brush were then cut from the entire hillside, and pushed to the bottom by means of a tractor, or by winch or even by hand, where the debris was decked and burned.

Then came a drilling outfit consisting of several wagon drills, which were anchored to trees with winch lines, and a special unit mounting two 4-in. (Joy) drill rigs on a heavy tractor. The wagon drills, using 2¾ in. Timken carboloy bits, put down

★ Two 4-in. drills, mounted on a heavy tractor, spearheaded the opening up of a 250,000 cu. yd. rock hillside cut on the Savin Construction Corporation Thruway project north of Catskill, New York. Note how holes are being slanted outward for the initial bench shot

Yardage on Savin's Big Thruway Job

holes as deep as 30 ft., and the heavier drills 18 to 55 ft. in order to get the first bench wide enough to accommodate a 6-in. drill rig expected to be brought in.

Dust collector units served the operation, as is required on all rock drilling under New York state safety laws. Air was furnished by three 600 cfm. compressors through a 6-in. line, this line size being adopted as standard for the job so that variable batteries of 600's up to four or five units could be used as the work required.

The road will come out of this 2,000 ft. long cut over a 292 ft. tunnel and across a fill drained by an 8-ft. diameter corrugated plate pipe culvert 476 ft. long. A 2½-yd. shovel and heavy rear-dumps worked this location, assisted by a large backhoe which cut pipe trench and helped pile stumps and brush.

Five miles to the south of this operation, another section was being opened up by nine wagon drills, four 600-cfm. compressors and a 4-yd. shovel loading to rear-dumps. Two of

★ Gasoline engine powered dust collectors were required, one or more for each rock drilling crew

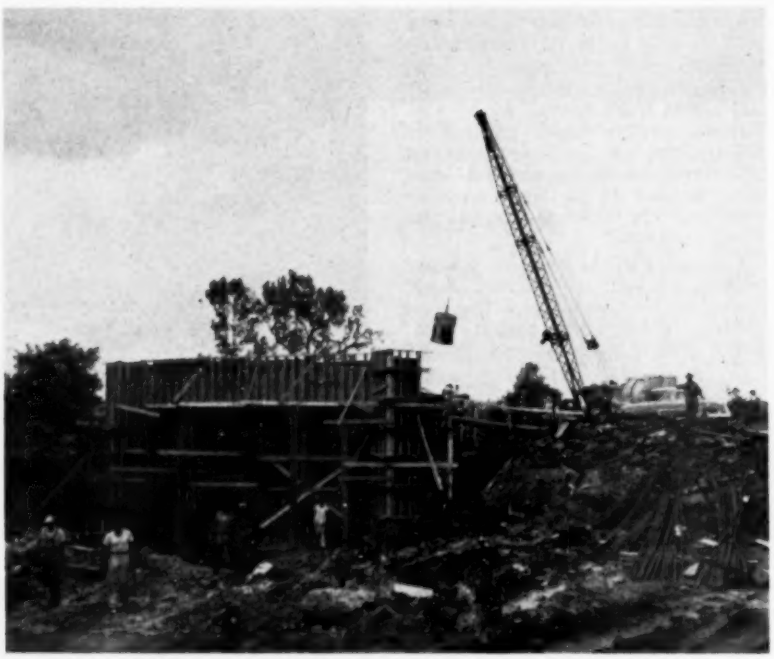
★ Four-yard shovel moved 2,000 to 2,500 cu. yd. per 10-hour day

★ Four "600" compressors in this battery which served 15 wagon drills ahead of the 4-yd. shovel. Similar batteries elsewhere on Savin's job

★ Air operated winches on the wagon drills saved time on hillside work

★ Twin express roadways being cut through the Catskills on Savin's project

★ Thirty-five ton, 16-tired rock buggy dumping on high roadway fill in the vicinity of Leeds, New York



★ The Savin project included few bridges because of the high roadway location along bluff tops, and absence of cross roads. Ready-mix was supplied for this 180-ft. rigid-framed roadway underpass

★ Another big shovel (3½-yd.) on the Savin project—one of five or six separate outfits along 22.7 mile project

Savin's famous 35-ton, 16-tired rock buggies, made for wartime airfield work, were pressed into service here. This team averaged 2,000 to 2,500 cu. yd. per 10 hour day. As shown by one of the photographs, the shovel operator left a fairly steep, irregular cut face, in accordance with plans to preserve a "natural" appearance through the scenic Catskills.

At another point a 3½-yd. shovel was loading to bottom dumps of 14 to 20 yd. capacity, for relatively long hauls to a fill in valley location. Still another smaller drilling operation was also in progress, using a 2½-yd. shovel. And, nearby, a crew was pouring ready-mix for a 180-ft. rigid-

(Continued on page 73)

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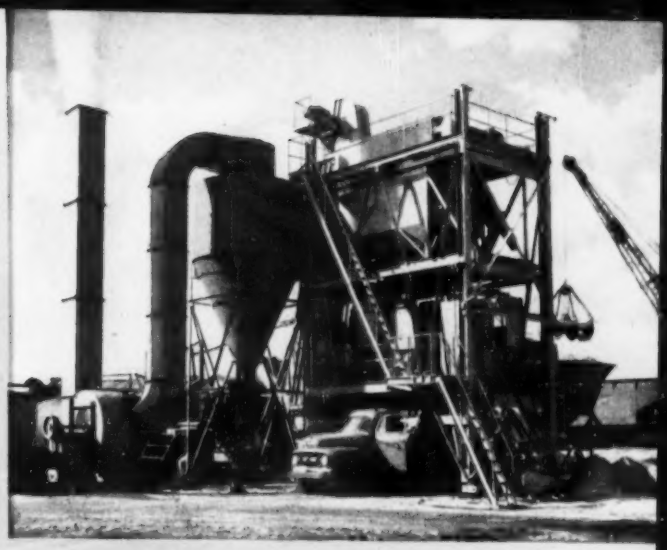

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250 TONS PER HOUR of 1" material and 25% to be crushed and more, with lower crushing percentages! That's the report about Cedarapids Commander Plants from all over the country. The Commander is designed for producers who need greater output of fine crushed products, or where pit conditions put a bigger load on the secondary crusher.

200 TONS PER HOUR of 1" material and 20% to be crushed is the conservatively rated capacity of the Cedarapids Super Tandem under average conditions. The high screening capacity of this unit fills the need for a plant which can process material with high percentages of fines or excessive amounts of soil, sand, clay or semi-wet material.

300 TONS PER HOUR of 1" material and 20% to be crushed for the Cedarapids Master Tandem, the largest, self-contained one-piece portable plant in the Iowa line. This big unit is ideal for your biggest jobs . . . and "Masters" them all.

IOWA MANUFACTURING COMPANY

Cedar Rapids, Iowa, U. S. A.

★ Two steel beam railway deck spans being rolled into position—Chesapeake & Ohio structure at Lytle Street underpass, Fostoria, Ohio

Novel Underpass Methods

Speed Traffic Relief for "Crossing Gate" Town

Traffic snarl on routes through Fostoria, Ohio, to be alleviated by grade separation and arterial program of Ohio Department of Highways. Visintine & Co., general contractors, roll new underpass decks in place between trains as part of $2,575,000 contract.

CITIZENS of Fostoria, Ohio, are soon to benefit from a construction job that has several aspects of more than local interest.

The project will streamline arterial highway travel into, through and out of this small city—setting an example for the elimination of urban bottlenecks in hundreds of communities everywhere.

The resourceful construction methods employed shortened the job time, reducing the inconvenience to local citizens and offering techniques widely applicable wherever bridge decks must be put into service "between trains."

The job was handled smoothly despite the participation of seven different agencies, thanks to good advance planning and job management.

Numerous Tie-ups

First, a few words of comment on point Number 1. The project in a nutshell consists of the elimination of three (or should we say four) railroad grade crossings, together with construction of extensive storm sewer outlets and reconstruction and widening of urban links of U. S. 23 and Ohio state routes 12 and 18. An additional grade separation and approaches is contemplated as a future project.

Fostoria with 16,000 population is a "railroad town," being at the junction of five railroads which intersect within a few thousand feet of each other. Most of the city's streets are cut by at least one railroad. Fostoria is also a hub for several highways, including the heavy industrial truck route U. S. 23 on the Detroit-Toledo-Marion-Columbus axis. The combination has had the city tied in a knot for years, with traffic continually piled up through the business district behind crossing gates. The Fostoria problem has epitomized the urban-arterial connector situation which faces state highway departments in every heavily populated state; until traffic can get through cities more easily, long and middle distance highway travel and transport will not realize its full potential.

The project here described will, in effect, give Fostoria streets back to its local citizens and merchants. While in the long-range it is an expedient, short of the eventual by-

pass which engineers often recommend for small communities along an inter-city route, it nevertheless is a sensible solution that is bound to pay dividends in safety, time saved and reduction of congestion.

The Fostoria program was worked out by engineers of the Ohio Department of Highways in cooperation with the U. S. Bureau of Public Roads, the City of Fostoria and the various rail lines. A contract was executed in January, 1951, with Visintine & Co. for $2,575,000 covering underpasses, drainage, paving and related work.

The project was divided into three parts for construction management, including progress reporting and accounting, as follows.

Job in 3 Parts

A—The Mid-Block Underpass, on new location, consisting of two closely adjacent bridges of the Nickel Plate and the Baltimore and Ohio railroads respectively, and immediate appurtenances, pumping station for drainage, etc. Construction cost $570,000.

B—The Lytle Street Underpass, on a widening of an existing street, consisting of two parallel but widely separated skewed bridges carrying the New York Central and the Chesapeake and Ohio railroads respectively, with pumping station and a half-mile 36-in. storm sewer outlet. Construction cost $1,100,000.

C—Outlet drainage and access streets consisting of about 3 miles of 4-lane-divided street pavement and sidewalks, 2,500 ft. of 60-in. storm sewer and 2,000 ft. of 48-in. outlet sewer. Cost $905,000. Foregoing costs and footages approximate.

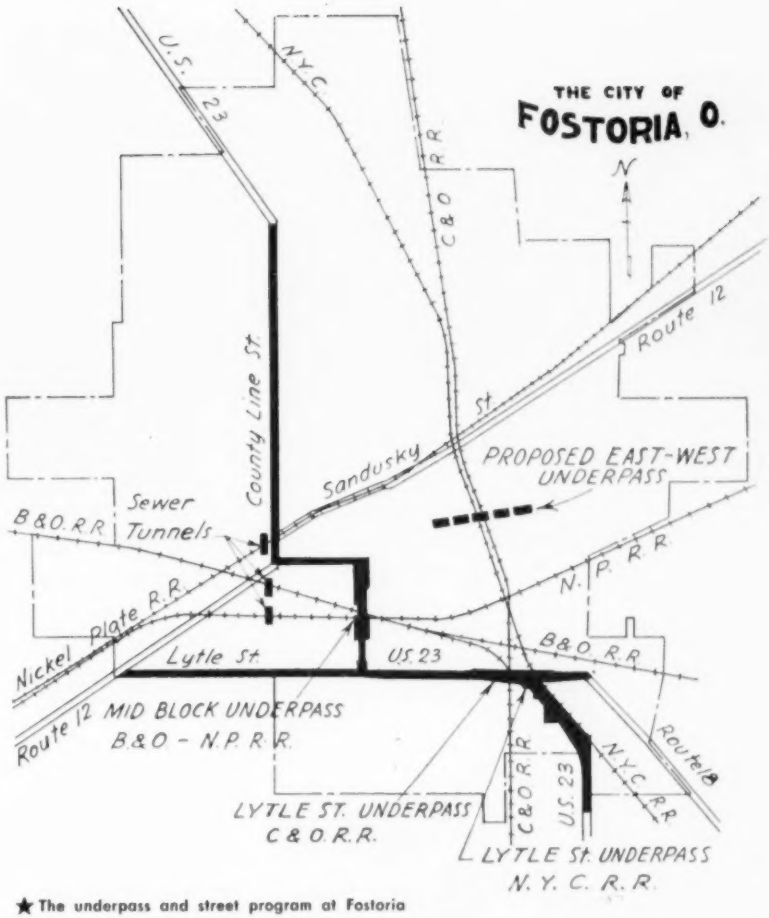
The railroad companies furnished the designs for the railroad structures. The Ohio Department of Highways made the preliminary study, designed the sewer and street work and supervised the job with railroad inspectors cooperating on the bridges and furnishing force account trestle and track crews.

Grubbing of some 600 trees marked the start of the 2½ years of work now nearing completion. Next started was the sewer work, for which concrete pipe was used throughout. Spoil from trencher cuts up to 16 ft. deep was piled on blocked-off streets, using the entire pavement and adjacent sidewalk for storage pending disposal at distant dumps. All backfilling was done with granular borrow, which not only met porosity specifications but also largely eliminated tamping.

Tunneled Under Tracks

Both the 48-in. and the 60-in. sewer lines, which outletted into a branch of Portage River, had to be tunneled under rail lines adjacent to the underpass sites.

Longer of the two tunnels was the one for the 48-in. line which passes under two B & O tracks and 276 ft.



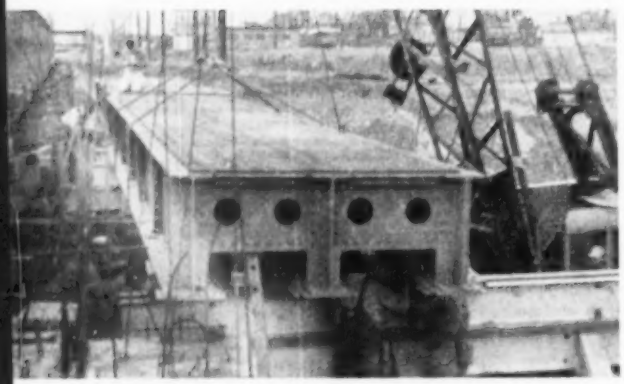
★ The underpass and street program at Fostoria

width of Nickel Plate rail yard. Armco steel plate tunnel liner was used, the procedure being to dig a pit at the portal, then tunnel by means of air spades, and taking in liner units by hand for bolting up as the work progressed. After completion of the tunnel, concrete pipe sections were

★ The contractor batched concrete for structures and paving at this modern plant near the job, and mixed in transit

★ The Nickel Plate and B & O railroads cooperated on this double underpass. Double pile bents for the construction trestle, driven before excavation, were protected by leaving earth around them as shown

Building the "Mid Block" Underpass



★ Time and expense were saved in setting the Nickel Plate's construction trestle by prefabricating the complete spans, which were set with a crane

★ Here the permanent underpass deck for the two B & O tracks is constructed on rollers and ready to move into position

skidded into place using a crane stationed at the working end. Skidding was done by the hoist cable passed around a snatch block anchored at the far end of the tunnel.

The space of approximate 4 in. between pipe and lining was then filled with cement grout pumped into place by means of a compressed air grout pump and steel pipe sections. The pipe in tunnel lies 11 to 16 ft. under the surrounding ground surface. The soil encountered was a compacted sandy clay, typical of that underying this old lakebed area.

The 60-in. sewer line was tunneled at another location, using similar methods .

Building Temporary Trestles

During the sewer construction, carried out in 1951, work also progressed on approach excavation, which was carried to within a few feet of the railroad structure lines, leaving the soil around the structure sites undisturbed.

First, to describe methods used at the "Mid Block" Underpass of Section A. Here the double-track Nickel Plate and double-track B & O lines converge at a sharp angle with each other, requiring construction of two closely adjacent but non-parallel underpass bridges (see plan sketch and also photo).

As with all the railroad work, the companies here performed most of the trestle construction by force account. The procedure was to drive trestle piling between the rails into the unexcavated ground, excavate and temporarily bridge across locations of permanent piers and abutments, then excavate and build the piers and abutments, all without disturbing traffic except for the few hours at a time required to get the piling driven and the temporary trestle I-beams in place.

Due to the very hard soil it was impossible to drive timber piling to sufficient penetration. Armco spiral welded hollow steel piling was driven to refusal to form double bents. Since the refusal point was at a depth about equal to the bottom of the footings, it was considered necessary to leave a partial mound of undisturbed earth around each double bent to assure sufficient bearing during construction. These mounds were removed after completion of permanent bridge.

For the temporary trestle the B & O used I-beams with wood spacers. Beams were set by railroad crane.

The Nickel Plate used an expedient for its trestle spans that saved much time and trouble. This consisted of pre-fabricating I-beams into span units complete with stiffener angles,

★ A general view of the "Mid Block" underpass site—both railroad lines on temporary trestle; excavation for depressed roadway in progress; permanent encased I beam deck span seen at right, awaiting the move-in

★ Each pile position was first reamed by the 6-in. power auger, here shown full length, and swinging into position

★ Auger used was operated with the power mechanism here shown. It was channeled within an ordinary pile lead frame

riveted connections and deck plates.

The railroad commissioned the contractor to place the trestle spans, the three spans being set and track work done for each track in a single day while traffic used the other track. A Lorain 1½-yd excavator dug out alongside, stripped track, set the steel and had the track back in service by nightfall.

Work then proceeded on the concrete pier and abutments, which required no piling.

Decks Rolled in Place

For both the Nickel Plate and the B & O underpass the permanent deck spans were built alongside and rolled into position. The superstructure for both railroads consisted of concrete encased I-beams, two spans per bridge, each span weighing about 612 tons. The spans were built on rollers supported between steel plates on double pile bents.

The two spans for a complete bridge were fastened together and drawn laterally into position as a unit by means of four winch trucks located in the excavation alongside.

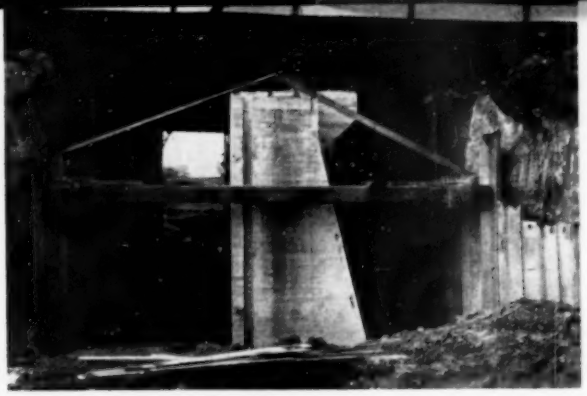
The methods used to construct temporary and permanent trestles for the two "Lytle Street" or Section II underpasses were similar in many respects.

For the New York Central structure, in order to get sufficient penetration for the temporary wood trestle piling, the engineers hit on the idea of boring a 6-in hole at each pile location to the depth desired, then driving the pile. A crawler crane with a Ka-Mo power earth auger set in the pile leads performed the drilling. This idea resulted in very true bents requiring little blocking to brace. Single bents were used. Excavation was then completed using a pullshovel and front-end loader immediately under the trestle and the

Piles Pre-Bored for NYC's "Lytle Street" Bridge

★ Deep driven piles shown here as pull-shovel excavates for the permanent underpass pier and abutments

★ N Y C underpass is nearing completion, the temporary trestle pictured above having serving its purpose and being removed. C & O underpass in background



★ Shallow driven piles here support the temporary trestle. Excavation proceeding for permanent pier and abutments, with heavy shoring placed around. Undisturbed soil left around bents to protect bearing value. (Right): Abutment completed except for wingwalls

Constructing the C & O's "Lytle Street" Underpass at Fostoria, Ohio

★ Showing how shoring beams were left in place during casting of abutment. (Right): Both abutments and center pier built and site excavation in progress

★ Girders and permanent steel deck assembled on rollers and ready for moving into place (as in the "Mid Block" underpass, which is pictured on another page)

concrete pier and abutments were then constructed for the permanent bridge.

For the nearby C & O bridge, wood piling was driven without boring. Rather than pre-drill and place relatively long piles, it was decided to drive double lines of wood piles to refusal (about 18 ft.) and protect the piles during construction by leaving earth mounds confined in steel sheeting. The sheeting under the tracks consisted of 8-in. steel H-piles at about 4-ft. centers with heavy timber lagging placed between to form a solid wall. Steel sheetpiling was placed around the corners of the mound at end bents. The walls thus formed were then braced by heavy timber struts. These timbers were left in position during construction of the concrete piers and abutments, temporary openings being left in the concrete where the timbers extended through. This shoring system was removed on completion of the bridge.

The permanent NYC spans consisted of plate girders with plate decks and concrete and asphalt mas-

(Continued on page 72)

Now! A new "break" for the driver

. . . is a "break" for your delivery costs! The world's most comfortable truck cab cuts driver fatigue!

Keeping the driver happy by reducing driver fatigue is not the only virtue of the new Ford Truck DRIVERIZED CAB.

Easier driving, for example, means safer driving! Easier driving means greater efficiency in terms of more trips, more stops, more deliveries per day—which means a more profitable operation.

The new Ford Truck DRIVERIZED CAB is just one of many new *time-saving* features that help *get jobs done fast!*

For sustained speed travel, Ford provides new LOW-FRICTION power in V-8 or Six. For faster, easier handling, Ford provides Synchro-Silent transmissions in every model—and new "short-turn" front axles.

Both Standard and Deluxe DRIVERIZED CABS offer all the features mentioned on this page. See your Ford Dealer for full details.

DRIVERIZED DELUXE *cab shown in photos available at slight extra cost.*

SWING *open the new, wider doors!* Door handles are the easy-operating push-button type . . . like you get in quality cars. Door latches are new rotor-type.

HOIST *your size 12's into the cab!* Plenty of room between the seat and door pillar. No need to do a toe dance getting into or out of a Ford "DRIVERIZED CAB!"

SLIDE *into the wide, comfortable seat.* Bounce on it to test the super-cushioning action of Ford's exclusive *seat shock snubber* and new non-sag springs.

SWEEP *your eyes across the new one-piece windshield.* With picture-window visibility like this you can really navigate. Safer driving, of course! Less eye-strain!

GLANCE *back through the 4-ft. wide rear window.* Heads right or left, you can see the space you're backing into. Why pay extra for rear quarter windows?

STRETCH *your arms into big cab roominess.* With more hip-room than any of the 5 other leading makes, FORD DRIVERIZED CABS banish that "squeezed-in" feeling.

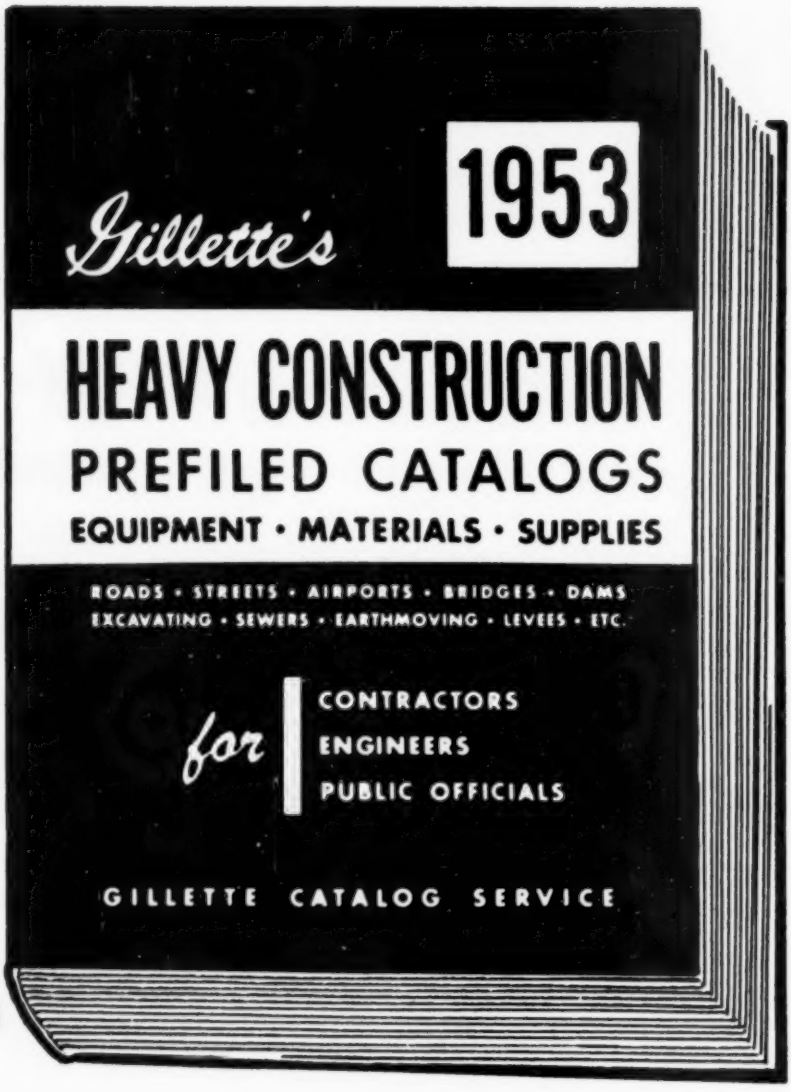
New F-900 BIG JOB has a 27,000-lb. G.V.W. rating for extra heavy hauling work. LOW-FRICTION 155-h.p. Cargo King V-8 offers high sustained torque to give more performance flexibility for your heaviest loads.

FORD ECONOMY TRUCKS

SAVE TIME! SAVE MONEY! LAST LONGER!

It's in your Office Now . . .

KEEP IT HANDY—
USE IT OFTEN—



Your most useful source of Buying Information

- This book saves you cabinet and floor space and the secretarial time that would otherwise be spent in classifying and filing individual manufacturers' catalogs.
- It saves you, too, the time and trouble of writing to manufacturers for the information you need. Here are enough facts to enable you to study the product that interests you and to decide whether to call your local dealer or distributor for decisive action.
- When you want information quickly, on a certain class of product or on the product of a specific manufacturer, turn first to the index for the name or trade name of the product in which you are interested and then to the manufacturers' catalog which is arranged in alphabetical order by manufacturers' name.

When you are in the market for new construction equipment, materials or supplies, turn to Gillette's Heavy Construction Prefiled Catalogs for information on what to buy and from whom. Here's the swift, economical and satisfying way to make your pre-purchase studies. In this single volume many of America's leading manufacturers of these products have placed their catalogs, many of them specially designed for your convenience—"boiled down" to save you time and energy.

CATALOGS...

the way you asked for them—PREFILED

Contractors, engineers, public officials PREFER receiving manufacturers' catalogs PREFILED rather than to have individual catalogs sent by manufacturers. Individual catalogs are usually mislaid or thrown away.

The manufacturers listed below have followed your wishes—and at considerable expense. Through the PREFILED method they have supplied you with catalog information on their products in the current 1953 edition of Gillette's Heavy Construction Catalog File (See opposite page). Be sure to take advantage of this information. Use the Gillette Catalog File all the time. Keep it handy every day—every week. Use it often. Consult the Catalog File when you want information before buying new equipment, materials or supplies.

Here is the list of manufacturers who have supplied you with buying information on their products.

Adams Manufacturing Co., J. D.
Allis-Chalmers Manufacturing Co.
All Purpose Spreader Company
American Air Filter Co.
American Bosch Corporation
American-Coleman Company
American Manganese Steel Division
American Marietta Co.
American Steel & Wire
American Tractor Equipment Corp.
Anthony Company
Armco Drainage & Metal Products, Inc.
Arrow Manufacturing Company
Austin-Western Company

Baldwin-Lima-Hamilton Corp.
Badger Machine Co.
C. L. Ballard
Beardsley and Piper
Bicknell Manufacturing Company
Briscoe & Son, E. V.
Bros Boiler & Mfg. Co., Wm.
Buda Company, The
Buffalo-Springfield Roller Co., The
Butler Bin Company

Carey Manufacturing Co., The Philip
Carson Company, H. Y.
Carter Co., Ralph B.
C. H. & E. Manufacturing Co., Inc.
Chausse Manufacturing Co., Inc.
Cleaver-Brooks Company
Cleveland Fermgrader Co., The
Cleveland Frog and Crossing Co.
Cleveland Trencher Company, The
Clipper Manufacturing Co.
Clyde Iron Works
Concrete Surfacing Machine Co.
Crockett Brothers
Cummer & Son Company, The F. D.
Cummins Engine Company, Inc.

Davenport Besler Corporation
Detroit Diesel Engine Division
Dixie Tally-Ho, Inc.
Dorsey Trailers

Eagle Crusher Co., Inc.
Electric Tamper & Equipment Co.
Erie Steel Construction Company

Felker Manufacturing Co.
Fiske Brothers Refining Co.
Flexible Road Joint Machine Co., The
Flintkote Company, The
Foundation Equipment Corporation
Frank Manufacturing Co.

Galion Allsteel Body Company
Galion Iron Works & Mfg. Company
Gar Wood Industries, Inc.
General Excavator Co.
General Motors Corporation
Gledhill Road Machinery Co., The
Goodall Rubber Company
Goodall Division, Warner & Swasey
Haiss Mfg. Co., Inc., Geo.
H. & L. Tooth Co.
Hammermills, Inc.
Harnischfeger Corporation
Hauck Manufacturing Co.
Heltzel Steel Form & Iron Co.
Hercules Motors Corporation
Herman Nelson
Highway Equipment Co., Inc.
Hose Accessories Company
Hough Co., The Frank G.
Huber Manufacturing Co., The

Jackson Vibrators, Inc.
Johnston and Jennings Co.
Joint Equipment Company, Inc.
Joy Manufacturing Company

Keystone Asphalt Products Company
Kiesler Co., Jos. E.

La Crosse Trailer Corporation
Leece-Neville Co., The
Le Roi Company
Lincoln Electric Company, The
Littleford Bros., Inc.
Lubriplate Division

Marlow Pumps
Master Vibrator Company
Michigan Power Shovel Company
Minneapolis-Moline

Naugatuck Chemical Division
Noble Company

Oliver Corporation, The
Omaha Standard
Onan, D. W. & Sons, Inc.
Osgood-General
Ottawa Steel Products, Inc.
Owen Bucket Co., The

Pacific Car and Foundry Company
Page Engineering Company
Philadelphia Textile Finishers, Inc.
Phoenix Products Co.
Pioneer Engineering Works
Pitman Manufacturing Company
Porter, Inc., H. K.

Republic Steel Corporation
Riddell Corp., W. A.
Rogers Brothers Corporation
St. Paul Hydraulic Hoist
Salem Tool Company, The
Sauerman Bros., Inc.
Schramm, Inc.
Service Supply Corporation
Serviceed Products Corp.
Shunk Manufacturing Company
Standard Steel Corporation
Sterling Engineering & Mfg. Co.
Stow Manufacturing Company
Sumner Equipment Limited
Super-Compactors, Inc.
Symons Clamp & Manufacturing Co.
Syntron Company

Talbert Construction Equip. Co.
Tarrant Mfg. Co.
Thurman Machine Co., The
Timken Roller Bearing Co., The
Titan Chain Saws, Inc.
Transport Trailers, Inc.
Tuthill Spring Company

Universal Engineering Corp.

Vibro-Plus Products, Inc.
Vulcan Tool Manufacturing Co.

Warner & Swasey Co.
Waterloo Foundry Co., Inc.
Waukesha Motor Company
Wellman Engineering Co., The
Whitestown Trencher Co., Inc.
Wico Electric Company
Williams Form Engineering Corp.
Winter-Weiss Co., The
Wyoming Valley Equipment Co., Inc.

Yaun Manufacturing Co., Inc.

Correct Care and Handling of Wire Rope

By Walter C. Richards
Chief Engineer
Leschen Wire Rope Division
H. K. Porter Company, Inc.

Installing. It is good practice to wind the rope directly from the reel to the drum, being careful to see that the bends are made in the same direction as when transferring rope from one reel to another. Mount the reel with the axle parallel to the drum and keep it under tension to avoid accumulation of slack. On a smooth-faced drum a little more tension should be applied and the wraps kept close together without crowding. A right-lay rope spools best if wound from left to right over the top of the drum when viewed from the side opposite to that from which the rope is leading onto the drum. If underwound, the rope should lead from right to left.

Breaking In. It is very important, when starting to operate a moving rope, that the machine should be run for a while with no lead, and for another period with a light lead to enable the wires and strands to adjust themselves. By so doing the rope will have "set" itself to the working conditions and when full operation is reached, it will operate more safely and efficiently. The time spent in breaking in a wire rope will be more than regained by the extra service that will be obtained.

Working Load. The ratio of the rated breaking strength to the normal working load is called the safety or design factor. In selecting the proper rope to use on any installation, it is necessary to employ an appropriate design factor. The estimated design factor should be greater if a careful calculation of all the forces acting upon the rope is not made.

★ The wrong way to take wire rope from a reel

It is impossible to set a figure to be used in all cases, as operating conditions are never the same. Such great variation exists that design factors may range from 3½ to 10. For estimating work of a general nature, a factor of 5 or 6 is frequently used.

The factors influencing the selection of the proper rope include the dead load, speed, acceleration and deceleration, length and weight of rope, diameter, number and arrangement of sheaves, size of drum, and fittings used.

Underpass methods

(Continued from page 68)

tic protection. The spans were built in place, the NYC's construction trestle noted above having been built on a temporary location alongside.

The permanent C & O spans were built on rollers. These spans, while varying from 5 to 63 ft. wide to accommodate several tracks, were of relatively light construction, consisting of I-beams with plate deck and concrete protection. A trestle-supported roller system was used, as on the Mid-Block bridges, and the spans weighing up about 300 tons each were drawn into place in tied pairs using a stationary steam hoisting crane and block and tackle lines located along the end roller line.

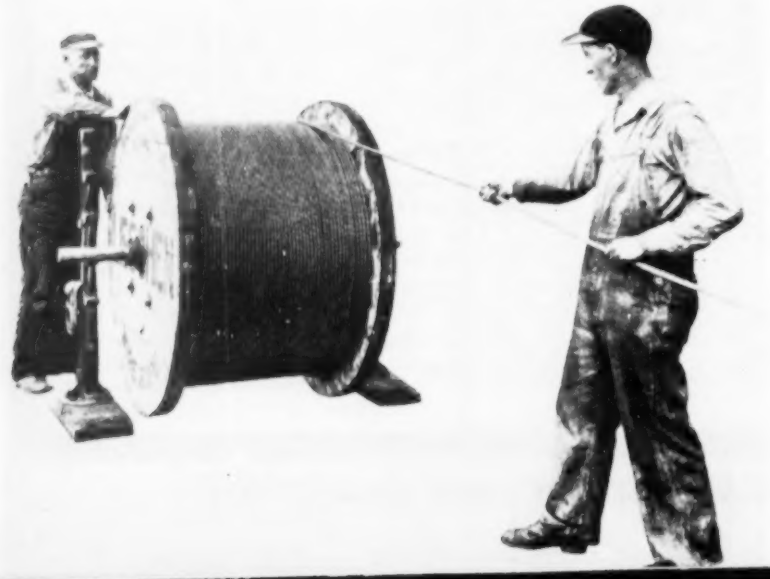
Ready-Mixed Concrete

The contractor supplied concrete for the bridges, paving, walks and appurtenances from a Johnson batch plant and silo on the job, with transit-mix delivery. Conventional pavement finishing methods including mechanical spreader and finisher were used on street paving.

The $2,575,000 construction cost for the project was financed 25% by city, 15% by state, 50% by federal and 10% by railroad funds for the underpasses, and 50-50 state-federal for the drainage and street work. The total cost consisting of right of way, engineering, R.R. force account and contract cost, is about $4,000,000. The city of Fostoria issued $700,000 in bonds to finance its share of this and a future East-West underpass.

The job was directed in the field by Paul J. Eckert, project engineer with the Ohio Department of Highways, working under E. B. Bauer, division construction engineer, and George Lieber, division engineer, Toledo. Personnel too numerous to mention in the Department division and headquarters offices had some part in planning designing and carrying out the project. S. O. Linsell is Ohio Director of Highways. H. R. Craig is Chief Engineer of the Bureau of Construction.

Visintine & Co., veteran bridge and road constractors of Columbus, were represented on the job by James Visintine as general superintendent, Tom Visintine as superintendent of structures and Roy Hillyer, superintendent of roadways.



★ This is the proper way for taking wire rope from a reel

Tractor-mounted drills

(Continued from page 60)

framed underpass, one of several major structures.

Despite the fact that many miles of the 22.7 miles had not been touched, a combined output of 50,000 cu. yd. per week had been reached, with a much higher figure expected by late summer.

The Savin Construction Corporation, like many other Thruway contractors, has found that radio-telephone is indispensable to efficiency. The company had nine radio-equipped cars and trucks, and one office station on the job.

Burl A. Wilder is project manager, Jack Donovan and Earl Davis superintendents, and E. E. Hazard office manager.

Savin Construction Corporation Principal Equipment on 22.7 Mile Thruway Job

(As of July 1, during early phase of job)

- 8 shovels (Marion 4-yd., pictured on page 59; P & H 3½-yd., pictured on page 60; Bucyrus-Erie 2½-yd.; Lima 2½-yd.)
- 1 backhoe (Northwest)
- 2 cranes (Lima, Lorain)
- 2 draglines
- 2 truck cranes (Lorain, P&H)
- 8 heavy tractors (International, Caterpillar)
- 11 heavy tractors with dozers
- 15 bottom-dumps (Allis-Chalmers, Euclid)
- 15 rear dumps (Euclid)
- 8 motor scrapers (Allis-Chalmers, Caterpillar, Euclid twin-engine)
- 18 wagon drills (Ingersoll-Rand, Worthington)
- 2 quarry drills (Joy 4-in.)
- 16 compressors (Ingersoll-Rand 600, Worthington 500)
- 9 dust collectors (Kadko)
- 3 flat rollers (Buffalo-Springfield)
- 2 dual sheepsfoot roller units
- 6 cars
- 14 pick-ups
- 9 trucks (platform or dump, incl. heavy Mack)
- 6 service trucks (water, fuel, grease, welding, drill steel)
- 3 transit-mix trucks (Mack, Jaeger)
- 1 Gradall machine
- 1 trencher
- 4 shop welders
- 1 Jeep
- 2 concrete vibrators
- 2 generators
- 3 table saws
- 9 chain saws
- 1 boiler
- 3 concrete buckets

Note on Strewing Cables, etc., over the Job

To All Job Superintendents:

I have repeatedly noticed cables, drums half filled with grease, lumber, etc., all up and down the length of the jobs.

Cables are to be placed in the machines or left in the warehouse. There is room for spare cables on all machines, and that is where they should be. Shovel teeth or any other miscellaneous parts are not to be left lying on the job from now on.

You will instruct the fuel and grease truck operators that before opening a new drum of oil they are to completely use up the one already started. Drums are to be returned to the supplier as soon as empty if deposit drums.

(Above note, signed by A. I. Savin, appears on the office New York State Thruway project of Savin Construction Corporation.)

A New Sensation from **waqner**

Pipe Line Installation!

Digs Septic Tank Holes!

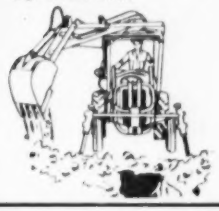
Digs Irrigation Ditches!

Utility Installation!

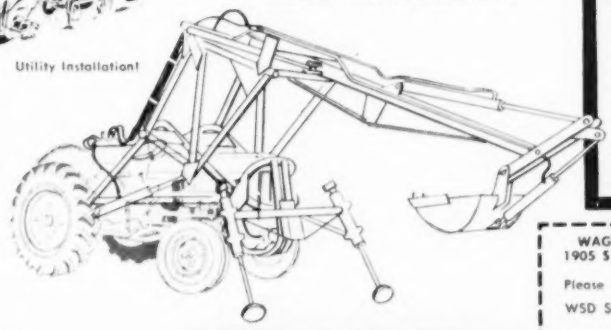
the WSD SWING DIGGER

This new WAGNER exclusive . . . the tractor mounted, front end SWING DIGGER . . . already has won the acclaim of contractors, plumbers, utilities and municipalities. Selling for 30% less than units designed to do the same work, the WAGNER SWING DIGGER has added versatility in that it can be converted to a Heavy Duty Loader by removing the Swing Boom and installing a standard WAGNER Dipper Stick.

Swings 8 feet to the right or left from center of hole and digs 8 feet deep.



Lifts to dumping height of over 8 feet for loading into truck.



Other uses include:
Grave Digging
Trench Work
Ditch Cleaning
Nursery Planting
and many others

Currently available for:
Ford, Ferguson, Allis-Chalmers, John Deere, Case, International Harvester, Massey-Harris, LeRoi, Minneapolis-Moline, and Oliver tractors.

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TRACTOR LOADERS
WAGNER IRON WORKS, MILWAUKEE 1, WIS.

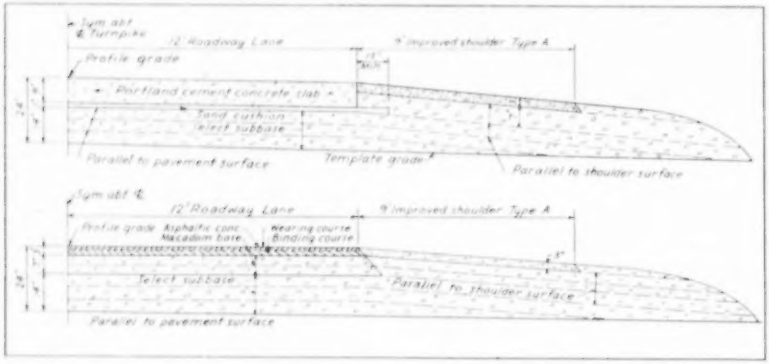
WAGNER IRON WORKS, DEPT. RS 1
1905 S. 1st St., Milwaukee 1, Wis.

Please send me complete information on a WAGNER WSD SWING DIGGER to fit a .....model .....tractor.

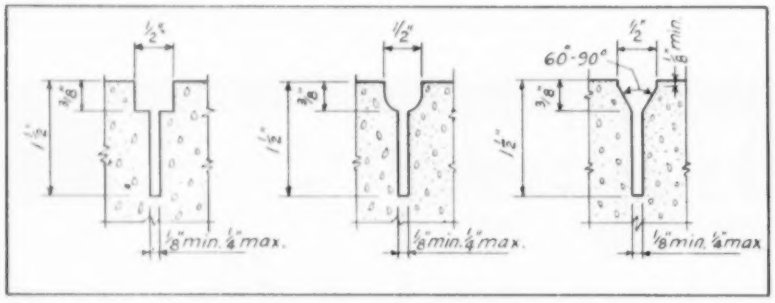
NAME.....
COMPANY.....
ADDRESS.....
CITY..... STATE.....

Alternate Paving Bids Planned for West Virginia Turnpike

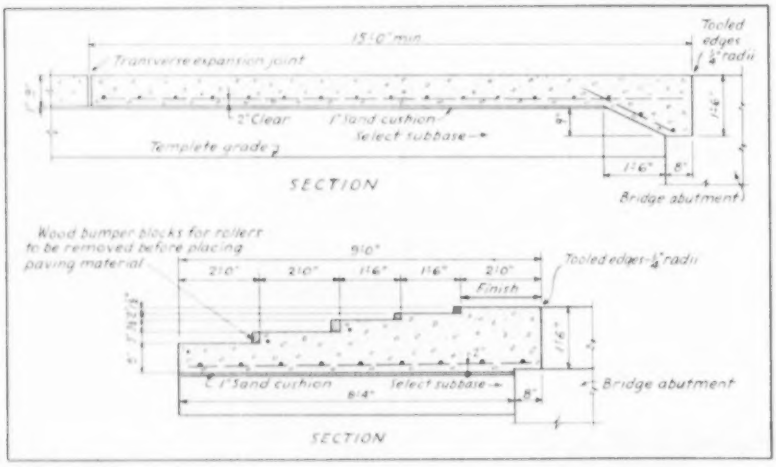
Editor's Note: Grading of 88-mile toll road through the mountains approached million-yard per week rate in August, with completion set for Summer of 1954. See October Roads and Streets for pictorial trip with a staff reporter over this unusual project, where big shovels and other units are evolving new construction patterns.



★ Portland cement concrete and asphaltic pavement design alternates, adopted for bids on West Virginia Turnpike paving



★ Alternate types of sawed transverse dummy joints permitted for concrete paving



★ (Upper): Standard approach slab design for concrete paving. Reinforcement continues through 2 or 3 additional panels, with sawed transverse joints. (Lower): Stepped concrete slab design for bridge approaches in asphaltic pavement

ALTERNATE designs for unreinforced portland cement concrete and for asphaltic concrete or penetration macadam, have been advertised by the West Virginia Turnpike Commission. On August 15 this body, of which Ray Cavendish is executive director advertised for bids on the first 30 miles of the 88-mile 2 and 3 lane road, to be awarded September 15. All paving is to be awarded this Fall.

Meanwhile, according to a spokesman for the general consultants, Howard, Needles, Tammen & Bergendoff, grading production had climbed to a pace of 900,000 cu. yd. per week by early August [see preliminary report, June R & S], and was expected to hold at a million-per-week level through the Autumn months. Roads and Streets, in forthcoming issues, will publish field notes on this project which sets a record for concentration of 2½ to 5½ yd. shovels and other heavy machinery on highway work.

1,400,000 Sq. Yd. Paving

The paving for the road including ramps will total about 1,400,000 sq. yd. The paving job has been divided into four sections, respectively 20, 30, 18 and 20 miles, subdivided into A, B, C and in some cases D subsections for bidding purposes. A contractor may bid as many subsections as he desires, individually or in combination. The Commission thus has opened the gates for the smaller fellow as well as the larger paving outfits. In any event, out-of-state contractors will figure strongly, it is expected, because of the large volume of work beyond the immediate capacity of local firms.

The Commission foresees that possibly some of the turnpike may go concrete and some asphalt. It has established no policy for the pavement type but will study the bids and make its determination. Frequent alternation between types along the different subsections is not to be expected however.

Concrete Design Details

The alternate bids in either case will include completion of the top 24 in. of the road comprising subbase, pavement and shoulders. The concrete design includes 14 in. of select subbase placed should to shoulder, 1 in. sand cushion, and 9" x 24' concrete pavement. No expansion joints will be included except at bridge approaches. Transverse dummy joints at 18-ft. intervals will be sawed in accordance with the accompanying sketch, the ⅛ in. joint being widened to ½ in. near the surface to better hold filler material. All concrete for paving and structures on the Turnpike is to be air entrained, with entraining materials added at mill or job or both as the contractor elects.

Expansion joints are not specified as to type, but the contractor will be required to submit his proposed joint design for test and acceptance. Pave-

ment is to be placed in either 12 or 24 ft. lanes, with longitudinal center joint sawed for the 24-ft. pour. Longitudinal joints between main roadway slab and adjacent truck lanes, ramps or other pavement are to be keyed and tied.

A novel design has been adopted for bridge approaches in the concrete alternate. Heavy wire or bar reinforcement with definite cross-sectional requirements in the axis direction, is to be included in the approach pavement, designed to hold cracks from opening. Reinforced panels of varying lengths with two or three transverse expansion joints are to be placed, the length depending on conditions. The first joint is 15 ft. back from the abutment, the second and third at 75 to 80 ft. intervals; a typical reinforced section will be 215 ft. long, with joints spaced 15-80-80 ft., the reinforcing continuing 40 ft. beyond the last joint.

Another unusual detail is the requirement of sawed transverse dummy joints at specified positions over box culverts that lie immediately under the pavement or have only shallow covering; again to control cracking in event of uneven settlement.

As an economy aid the aggregate gradation specifications are so written that the contractor may elect to use either normal structural concrete or paving concrete for such related work as medians, curbs, and inlets.

Asphaltic Design

The asphaltic pavement alternate consists of 14 in. of select subbase, 7 in. of penetration stone macadam (two courses), and 3 in. of hot mixed asphaltic concrete (2-in. and 1-in. courses). The details of the asphaltic pavement are generally in accordance with prevailing practice for heavy-duty bituminous flexible pavements. Type RS-1 emulsified asphalt will be used for bituminous binder for the penetration macadam.

Asphaltic concrete will be produced with 85-100 penetration asphalt cement. Three mineral aggregate sizes will be used, with combined gradation limits specified, as well as tolerances for the percentage of each aggregate in the mix. The tolerance for the asphalt is plus or minus 0.3 per cent. Marshall test procedures for density, stability and flow will be followed. Either batch or continuous type plants may be used under the specifications, which are quite detailed and explicit as to asphalt plant equipment, with certain automatic control features specified but not the fully automatic electronic equipment such as was required on the New Jersey Turnpike.

The template grade will be tested with a 50-ton rubber tired compactor after all drainage is in and prior to any paving operations, concrete or asphalt. A pneumatic roller is specified for use on the completed wearing

(Continued on page 80)

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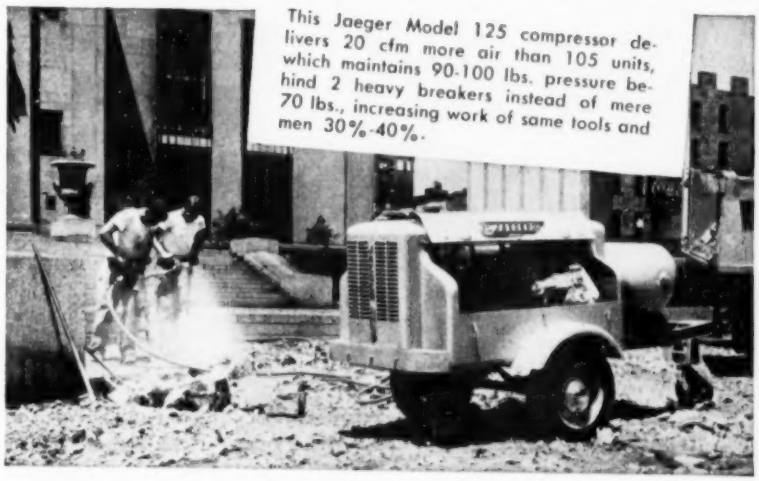

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JOB and EQUIPMENT IDEAS

Welder's rig has oversize exciter

In repairing road machinery and contractor's tools, this welding shop proprietor equipped his truck with a welding machine fitted with an oversized exciter. By using extra power from this unit the 110-V, D. C. grinder mounted over the rear fender can be used to grind or buff jobs as required. Also, by using an extension cord, hand grinders carried in the tool box may be carried to nearby jobs when needed.

A. G. Leach, of Oakland, California, owner and builder of the rig, carries two oxy-acetelyne units plus the arc-welder and has fitted it with hose or wire to reach jobs at a range of 200 ft.

Heavy brush rake

A novel attachment to the blade of an International TD-14A crawler tractor is speeding the right-of-way clearing on the 124 miles of power line being constructed by the Walco Engineering and Construction Company, Tulsa, for the Western Farmers Electric Co-Op. This time-and-money saving device is a brush rake, pictured here, designed and built by J. V. Wilson, Rush Springs, Okla.

Made of five 90-lb. rails reinforced on the hollow sides and extending 18 in. below the dozer edge, the rake is fastened to the top edge of the blade by a hinge. With this arrangement, when the dozer backs up, the rake swings up to dump the collected trunks, limbs, and most of the small twigs. The hinge also permits the rake to be mounted or detached in a matter of minutes.

Before Wilson leased his tractor and rake to Walco, a large clean-up crew did all the work by hand. Now, clean-up is done faster and with less cost by only two men. One is the operator of the tractor while the other serves as a helper to open fence gates and remove any small brush missed by the chain-saw cutting gang.

Blasting area reminder

"Are you in a blasting area?" read the signs along the haul roads on the heavy rock grading job of Groves, Lundin & Cox., Minneapolis contractors, on the West Virignia Turnpike. Purpose is partly to remind foremen in Jeeps to be sure the radiotelephone is turned off while in such an area. Foremen must contact field office at beginning and end of such turn-offs.

★ A. G. Leach's rig equipped for welding and cutting

★ Clean-up of heavy brush was expedited by this special dozer attachment. Inventor J. V. Wilson standing at left

★ Curb and gutter being formed by a towed spreader box

Kept full by the ready-mix truck, the hopper of the "chariot" is continually stirred by the rider using a shovel, while another shoveler assists in keeping the distribution even.

A heavy pipe hooked to the bumper of the mixer truck supplies hauling power to the box through small steel chain.

Wyoming department organization changed

The Wyoming highway department has been reorganized recently in the interest of greater efficiency, according to an announcement by J. R. Bromley, who is now superintendent and chief engineer.

Under the new plan, which affects about 450 employes, the state will operate out of five new maintenance and construction districts. R. G. Stapp is construction and maintenance engineer. Other major reassignments and reclassifications were made to expedite the growing volume of work.

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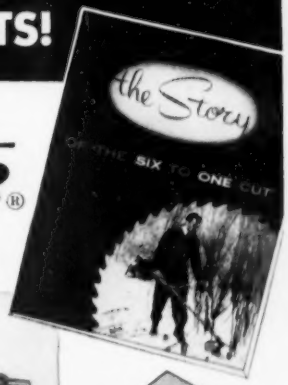

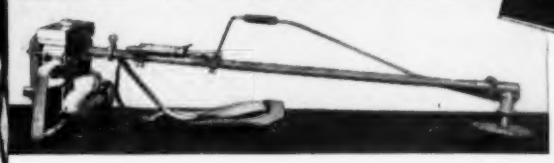

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★ M-K mechanics at the Los Angeles District shops in South Gate, California, overhaul a D-8 Caterpillar Tractor

How "M-K" Keeps $20,000,000 Worth of Equipment Moving

Four strategically located shops recondition the machinery of Morrison-Knudsen Company, Inc., in a program geared to this firm's many and widely scattered road, dam, airfield, reclamation and other construction projects

WHEN an organization reaches the size of Morrison-Knudsen Company, Inc., with its far-flung projects, joint ventures and subsidiary operations, many are curious to know what makes it "tick." Without attempting to answer this question fully one could certainly state that systematic care of equipment is one of the major factors in M-K's business success.

In fact, the firm would seem to be built around good equipment. The company has invested over five million dollars annually in new equipment in the past three years. A recent inventory showed over $20 million original purchase value of the company fleet. The equipment maintenance expense in 1952 was over $1,000,000.

In order to maintain peak efficiency of operations under today's highly competitive, highly mechanized conditions, the M-K company's policy is not to let their equipment grow old. The mechanical maintenance job, which reached into top management, centers at four large equipment shops located at Boise, Idaho (company headquarters), Los Angeles, Spokane and Anchorage in Alaska. These locations are selected to fit the complex of projects at home and abroad and to fit the company's more concentrated working territory.

Renewal Program

Any machine that cannot be renewed in one of these shops is sold for its depreciated value and replaced. The company's construction fleet in the United States and Alaska numbers over 3,600 units ranging from small vibrators to big excavators. At any given time there are around 250 tractors, 110 power shovels, cranes, draglines and pull shovels, 700 trucks and automotive units, and other equipment in proportion. Naturally under the policy of being mechanically self-contained the shop facilities must be larger and more complete than those of most contractors.

As part of the central management, one master mechanic and three assistants travel on the road constantly, covering the four overhauling shops.

Of course there is a field shop on each major project, and a staff of mechanics there to keep equipment going and in top condition. But most major overhauls are done at the four central shops, where a high degree of specialization is established and special mechanical facilities are available. Any type of equipment owned can be overhauled and rebuilt here by the M-K mechanics, who include many veteran employes and who are reputed, as a group, to be "the best in the business."

Largest of the four shops is the one at Boise. Here under foreman

★ Over-all view of the main bay in M-K's Boise shops showing a Euclid wagon in process of overhauling

Irv J. Fordham the company not only overhauls the tired and beat-up units shipped back from completed operations, but also manufactures many such parts as gears, shafts, bushing and special parts that may not be quickly and economically obtainable. Nineteen different heavy equipment units can be overhauled at one time in the shop's roomy bays. Usually about 45 or 50 mechanics work there under assistant foreman Wallace Warner, being supervised by section heads devoted respectively to welding, shovel repair, automotive, ignition and large trucks.

In Los Angeles a recent count showed 37 mechanics working under superintendent James M. Ponner, with a like number of employes in the warehouse, yard and office. Under foreman Isaac Rains recently the repair crew performed the feat of renovating and shipping out 25 carloads of equipment in 60 days for Mocuzari Dam southeast of the California border. Another 25 carloads had previously been shipped to the same project.

This mechanical center, as with the others, has developed an efficient routine for the important task of loading and shipping out. Each unit is properly crated, weather proofed, or mounted on cars or trucks, as the case may be.

The Spokane shop under foreman John L. Morrison had nine mechanics at a recent count, and a dozen other employes. In 1952 alone this smaller shop handled $285,000 worth of repair work for equipment serving projects in Idaho, Montana, Washington and Oregon.

The Alaska shop, set up to serve the company's large-scale airfield and other defense work in the area, has had a dozen mechanics under master mechanic Walter F. Woessner. This shop shuts down in the winter.

Main Items, Morrison-Knudsen Co.

The following approximate talley covers a recent inventory. The items of course fluctuate from month to month.

Planes (2 Cargo, 2 DC 3's, 2 smaller)	6	Concrete Mixers	58
Asphalt Plants	3	Motor Cars (R.R.)	21
Autos and Trucks	650	Muckers	9
Batch Plants	21	Pile Extractors and Hammers	18
Blowers	8	Power Brooms	5
Boilers	7	Power Control Units	277
Compressors	125	Pumps	275
Concrete Placing Equipment	71	R. R. Tunnel Cars	82
Crushing Plants	33	Rippers	21
Derricks	6	Rollers	42
Distributors, Bituminous	4	Rollers, Sheepsfoot	27
Ditching Machines	7	Sand Drags	6
Dozers	240	Power Saws	55
Drills	168	Scales	9
Earth Wagons	157	Scrapers	105
Excavators	110	Screen Pulsators	4
Generators	80	Searchlights	2
Graders	49	Spreaders	10
Grease Outfits	10	Steam Cleaners	14
Hoists	46	Steel Benders and Shears	9
Jacks	11	Tampers	10
Light Plants	216	Tractors	276
Loaders	20	Tractor Booms	14
Locomotives	10	Trailers	67
Asphalt Mixers	10	Welders	190

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★ DEEP CUTS—approximately 7" maximum with 18" blade. 13.5 h.p. engine furnishes power to spare.

★ DOUBLE END SPINDLE for right or left hand cutting.

★ HINGED BLADE GUARDS—Front half lifts, exposing blade for close-up work.

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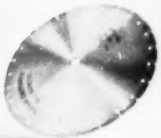

Felker DI-MET the SEGMENTED type diamond blade with peak performance! Built by the only manufacturer making both concrete cutters and diamond wheels. Band variations for every cutting requirement insure more footage—lower cost per cut!

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World's Largest Manufacturer of Diamond Abrasive Cut-off Wheels and Equipment

★ Overhead hoist removes dipper stick and bucket of Northwest 95 shovel, being completely overhauled in the Boise headquarters shops of Morison-Knudsen Company, Inc.

Warehouse and Yards

With each shop are spacious warehouses and equipment storage yards. These total 18½ acres at Boise, 11½ at Los Angeles, 6 acres at Spokane. Each store is under a foreman and each stocks thousands of items under a policy of carrying a carefully calculated list of spare parts, materials and supplies. The investment while not publicly known is high.

Under Boise foreman Fordham, who by the way has been with the firm for 23 years, much special equipment has been installed. The automatic welding facilities are among the most up-to-date and efficient in the business. While each automatic machine can do the work of five men, much work is still done by hand welders, who will always be indispensable. The acetylene gas used is made by the shop's own automatic generators.

Push-button radial drills could be mentioned as just one of the various types of equipment in the Boise machine shop, which also has a 500-ton horizontal hydraulic press for forcing shafts out of hubs. A good many shop units were fashioned for their specialized work by the M-K mechanics. Their ingenuity produced a grinder for carbide lathe bits. An electric oven for keeping welding wire dry is also shop designed and built.

The company's home office keeps all equipment records on IBM machines, such records covering depreciation permitted under tax regulations, monthly reports from jobs, etc. At the end of each month a report is sent in from each field job, giving the number of hours each machine worked, and other data. The headquarters office then bills the project on a rental schedule.

The rental rates for this bookkeeping purpose are set up on an experience basis, the rates of course being highest during the first year of a machine's life, with reduced charge-off rates for succeeding years.

As costly as these facilities are, they are regarded by the Morrison-Knudsen Company management as an essential means of economy and efficiency. Everyman in the organization is made to realize that field breakdowns may cost thousands of dollars, while steady performance and output are the key to the company's success.

West Virginia bids

(Continued from page 75)

course, as a means of accelerated "traffic curing" or densification of the course.

The asphaltic pavement design includes a novel stepped concrete approach slab at bridge ends. This slab (see sketch) has a step for each pavement layer, each step being at an elevation one-half inch lower than the finished surface of the related layer, for anticipated consolidation and for keying the bituminous pavement to the slab.

Paving aggregates will have to be imported by rail for most of the project whether concrete or asphalt is used. While rock abounds along the road—the excavation is largely rock and shale—the prevailing rock consists of varieties of sandstone not considered suitable for paving use. However local aggregates will be used for the select subbase for either type, and local sandstone is permitted in the penetration macadam specifications.

Fortunately rail lines threading through the mountain valleys along the Turnpike line give access at several locations, but a substantial amount of truck haul will also be required for paving.

Two standard shoulder types are specified, the alternates being in anticipation of four-laning this highway within a few years. Type "A" shoulder, to be used where the shoulder will not be disturbed by the dualization, consists of 3 inches of penetration macadam with an armor coat of liquid asphalt and chips.

Type "B" shoulder, for use where removal is anticipated for dualization, will consist of subbase materials with a similar armor coat. Shoulders are 9 ft. wide in general, except along truck lanes on long grades where narrower shoulder are considered sufficient.

Data on rolled shapes for 79 years back

An historical record of dimensions and properties of all iron and steel rolled shapes of the past 79 years will be published in September by the American Institute of Steel Construction, 101 Park Ave., New York 17, N. Y.

Entitled, "Iron and Steel Beams, 1873 to 1952," the publication is primarily for the assistance of architects and engineers who are remodeling or constructing additional floors to buildings erected 40 or 50 years ago, especially when original plans are not available. Much research was carried on to complete the project, and it is believed that information on practically all beams and column sections produced in this country can now be found in this one source.

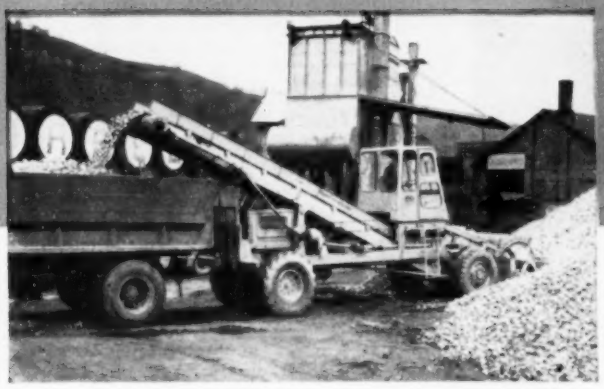
Tabular data is limited to beams and columns, since other sections such as angles, channels, and tees were standardized at an early date and have been produced since without significant changes. Of interest are the unit stresses recommended by early manufacturers which will be found ultra-conservative in the light of present day recommendations. Also included are A. S. T. M. specification requirements for tensile strength and yield point and the working stress recommendations issued by the A.I.S.C. The volume will have approximately 150 pages, 117 of which are plates. The price is $3.50 postage prepaid in the United States and Canada.

New Lippmann Distributor. Stockberger Machinery, Inc., 630 High St., Fort Wayne, Ind., has been appointed distributor by Lippmann Engineering Works, Milwaukee, Wis., for Indiana. P. A. Ross Machinery Co., 3120 Grand Ave., Dallas, Tex., has been appointed distributor for north and east Texas.

Adams TraveLoader

Speeds Loading Operations

For Contractors



Like many other contractors, Burrell Construction Company, New Kensington, Pa., finds a wide variety of uses for Adams TraveLoader. D. C. Traister, General Superintendent, says, "We operate two Adams TraveLoaders. These machines are kept busy loading surplus material on street construction jobs, loading stockpiled material for road and street grades, etc. We particularly like the heavier construction and better traction of the TraveLoader." ... Ask your local Adams dealer to give you a working demonstration of how the TraveLoader will cut loading time and costs—for you!

Here a road contractor uses an Adams TraveLoader for picking up surplus dirt on a road-widening job.

For Counties

Cass County, Indiana, uses an Adams TraveLoader for picking up surplus ditch and shoulder material in the process of maintaining proper drainage on its system of 1150 miles of roads. Ross Helms, Road Supvr., says, "We don't know how we could accomplish this program without the TraveLoader. We have loaded as many as 185 trucks in one day. Some days we sell enough dirt to pay operating expenses. We also like the TraveLoader for its speed in loading from stockpiles." . . . See your local Adams dealer for an on-the-job demonstration of the high-speed, high-performing TraveLoader.

This county-owned TraveLoader is loading gravel from stockpile for road resurfacing operations.

J. D. ADAMS MANUFACTURING CO. • INDIANAPOLIS, IND.

ADAMS

Motor Graders TraveLoaders Pull-Type Graders

Ice-Free Pavement Still Not In Sight

By S. M. Breuning

Research Engineer
Cambridge, Massachusetts

Joint Highway Research Project, Massachusetts Institute of Technology, Department of Civil and Sanitary Engineering and Massachusetts Department of Public Works.

IN recent months accounts have appeared in the press describing a snow- and ice-free road invented by Wilhelm Rademacher in Germany. It was reported that roads would stay free of snow and ice at temperatures as low as —60° and even —70° F. because an admixture in the surface course of the pavement, acting in conjunction with the radioactive emanations from the earth would melt the ice. And . . . better still . . . this admixture was said to increase paving costs by only ten to twenty cents per square yard. It was further stated that the State Laboratory for Materials Testing in Hanover had confirmed Mr. Rademacher's claims.

The Joint Highway Research Project at the Massachusetts Institute of Technology, like other organizations throughout the world, was skeptical but interested. Inquiries addressed to Mr. Rademacher brought no replies but correspondence with other people in Germany gradually unfolded the story.

A recent article in "Strassen-, Asphalt- and Tiefbautechnik" (a highway construction magazine) gives a fairly good history of the claimed invention. Mr. Rademacher first thought of using high frequency current in connection with chemical preparations added to the top layer of pavement, but this was too costly and offered technical difficulties. He then developed an admixture to asphalt or tar which he called "Electroswa Clorcatrinat 999 A" or "E.C. 999 A."

The "Niedersaechsisches Materialpruefamt" (State Laboratory for Materials Testing) in Hanover wrote that it had only determined the freezing point of this fluid for Mr. Rademacher, without knowing what it was to be used for. It was found to consist mainly of a concentrated salt solution. The laboratory has not tested or otherwise reported on snow- and ice-free pavements. It refuses all responsibility for claims made by Mr. Rademacher or others about the invention and has prohibited his using its name in connection with it.

According to the article Mr. Rademacher asked the Department of Road Construction of the province of Schleswig-Holstein in Kiel for permission to use his invention on a road. The first test was on a seven square yard area of bituminous pavement late in 1951. Results were favorable at +27° F.; below that temperature snow remained on the test area at the same depth as on the surrounding road. A second larger test in 1952 was a complete failure.

A third test pavement with doubled admixture was completed late in 1952 with 14% of the chemical added to the binder.

Results observed during January, 1953, were similar to those in the first test, but temperatures during the month were only a little below freezing. Complete data cannot be expected before 1954, when observations will be available for an entire winter.

Recent information from the Schleswig-Holstein Road Construction Department confirms that their tests with Mr. Rademacher's additive have showa no lasting results. For a few days after construction ice melted a little faster than on other roads, but thereafter there was no further observable difference.

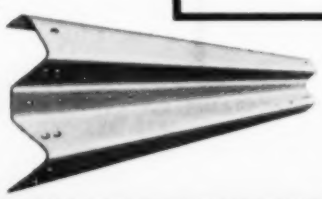
Hill Promoted by Hyster. Philip S. Hill, for the past several years general sales manager for Hyster Co., Portland, Ore., has been elected vice president in charge of all sales.

USF Barrier-Beam HIGHWAY GUARD RAIL

You *can* afford the extra safety of USF Barrier-Beam Guard Rail. It erects so quickly . . . requires no spring bumpers . . . no post guying . . . no anchors . . . that installed costs are lower than you expect. Routine maintenance is minimized and even damage is generally limited to a single length. Consider these factors and you'll agree . . . you *can* afford USF Barrier-Beam Guard Rail *everywhere*.

- High beam strength deflects vehicles
- Broad traffic face gives highest visibility
- Mounts directly to posts . . . no extra rigging.
- Rounded "Safety-Top" saves lives

Get Exclusive "SAFETY TOP" at No Extra Cost!



USF BYSTEEL

UNITED STEEL FABRICATORS, INC.
WOOSTER, OHIO

PRODUCTS Hollow Metal Doors • Prefabricated Metal Buildings • Window Wells
Highway Guard Rail • Bridge Flooring • Corrugated Metal Pipe

"Save money? Sure!"

THAT, in a nutshell, tells you why so many wire rope users in excavating and construction prefer Roebling wire rope ... it speeds up operations ... lasts longer on the job ... saves money that really adds up.

For the last word in wire rope efficiency and economy, call your nearest Roebling office or distributor for a Roebling recommendation.

ROEBLING CF&I
A subsidiary of The Colorado Fuel and Iron Corporation

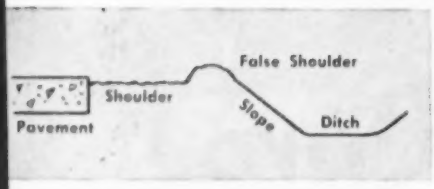
JOHN A. ROEBLING'S SONS CORPORATION, TRENTON 2, N. J. BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5535 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4601 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1930 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, TRENTON 2, N. J.

TELEGRAM

Mr. Public Official:

DO YOUR HIGHWAYS HAVE A SHOULDER PROBLEM THAT THREATENS SAFETY . . . CAUSES EXCESSIVE BREAKUPS OF YOUR PAVED ROADS? IF SO . . . HERE'S A PRACTICAL, ECONOMICAL METHOD FOR FIRST RE-SHAPING, THEN MAINTAINING THOSE SHOULDERS WITH ONE MACHINE, ONE OPERATOR.

THE PROBLEM

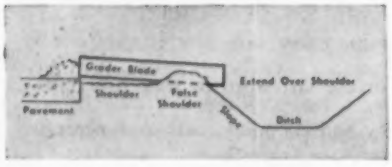


CROSS-SECTION of typical paved road with false shoulder that prevents proper drainage, encourages erosion of shoulder material and damage to pavement.

ACTUAL PHOTO of false shoulder, consisting of sod mat 3 to 4 inches high.

THE REMEDY

Cut off false shoulder with the Allis-Chalmers Model D's ROLL-AWAY moldboard—roll sod to edge of pavement.



Set grader moldboard as shown to insure clear cut and eliminate any obstacle to adequate drainage.

Windrow of sod consists mainly of root mat. Note that grader blade did not disturb or cut into shoulder gravel.

Load sod into truck with Model D's rear-end loader. Wide bucket lies flat on pavement, picks up cleanly without disturbing shoulder gravel.

Now slope shoulder with grader moldboard and feather windrow out behind with Shoulder Maintenance Blade.

The finished job—a smooth, safe, well-drained shoulder.

WITH false shoulder removed and proper shape re-established, the Allis-Chalmers Model D and rear-end loader with interchangeable Shoulder Maintenance Blade can *keep* the road in tip-top condition easily and at low cost. It's another money-saving application for the Model D, the most versatile of all motor graders. *For more information on shoulder maintenance, write now for Booklet MS-896*, or ask your Allis-Chalmers dealer for a demonstration.

ROLL-AWAY is an Allis-Chalmers trademark

ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A

Tough Blade
you won't drive thru

Fingertip Control
you don't have to fight

Easy Tilting
you don't have to tighten

NEW POWER CONTROL UNIT

Be sure to see the all-new Baker PCU-75 . . . featuring a Multiple-Disc Clutch with higher capacity—3-Way Adjustable Hand Levers—faster, more rugged brakes with single-point adjustment.

Tough Blade—Baker Bulldozers and Gradebuilders feature construction of tougher steel with greater wear resistance. That's why they last longer . . . why operators say "you won't drive through a Baker Blade!"

Fingertip Control—Operators of Baker-equipped A-C Tractors claim they do better work with Fingertip Control. They can *hold* the blade in any position—without settle or "suck-in". Responsive to lightest hand-pressures, the Baker Fingertip Control is one *you don't have to fight.*

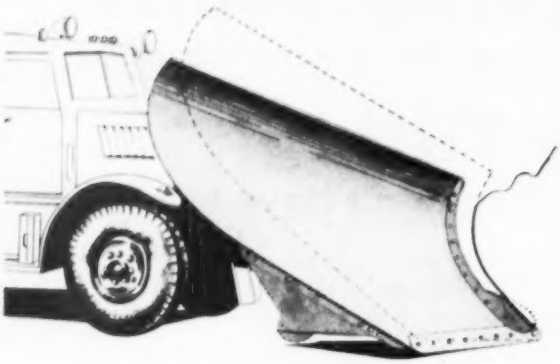
Easy Tilting—Two quick-shift pins at the trunnion brackets permit full arc-movement, up to 12" in five positions . . . with full-bearing contact that *can't* work loose—*never* needs tightening.

Your Baker, A-C Dealer will be glad to demonstrate!

Other Baker Products

THE BAKER MANUFACTURING COMPANY • SPRINGFIELD, ILLINOIS

NO MATTER HOW WET THE SNOW



THE FRINK *Won't WEDGE*

No matter how hard they hit or how wet the snow—the Frink V-Type Sno-Plows will not wedge or stick.

When bucking deep snow the weight and pressure of the snow causes the patented Heel Chain Suspension to compress the forward truck springs more than normally. When the forward motion stops, the truck springs, relieved of this pressure, force the heel of the plow up and forward (as shown by dotted line). The plow then resettles into normal position again—thus freeing the plow. This—plus the pivoted Drive bars—positively eliminates wedging.

Frink Reversible Type, One-Way Type, V-Type Sno-Plows and the Frink Roto-Broom are interchangeable on the same truck attachment.

For further information on this Sno-Plow write for catalog to nearest address, Box RS539

FRINK SNO-PLOWS

FRINK SNO-PLOWS, INC., CLAYTON, NEW YORK
DAVENPORT-BESLER CORP., DAVENPORT, IOWA
FRINK SNO-PLOWS of CANADA, LTD., TORONTO, ONT.

New Turnpike Legislation

Concluding a series of state-by-state legislative summaries from August Roads and Streets. Over 2¼ billion dollars in new toll road, bridge and tunnel projects are in the construction or active planning stage.

Oklahoma: Enactment of a new law authorizing construction of three more toll roads in the state was followed by organization of a drive by opponents to obtain sufficient signatures to initiative petitions to force a referendum on the bill. Backers of the petition will have until the first week in September to collect the necessary names to block the legislation.

The new act broadens the powers of the present Oklahoma Turnpike Authority to finance and construct an extension of the recently-opened Oklahoma City-Tulsa toll superhighway from Tulsa northeast to the Missouri line, and new turnpikes from Oklahoma City southwest to the Texas line and from Oklahoma City north to the Kansas line. A subsequently enacted amendment to the new law permits the State Highway Department to furnish money for preliminary engineering and surveys.

Virginia: A final report on an engineering study of a proposed toll road between Richmond and Petersburg was being awaited at this writing by the State Highway Department and a state legislative interim study group. A report on a similar study being made in the Virginia portion of the Washington metropolitan area was expected to be available in September.

The State Highway Department authorized the engineering firm of Wilbur Smith & Associates to make both studies in order to assist an investigation being conducted by a sub-committee of the Virginia Advisory Legislative Council, which is looking into the feasibility of toll roads to supplement the state's free road system.

Washington: New laws broaden the powers of the State Toll Bridge Authority to permit it to finance and build toll roads in much the same manner it now constructs toll bridges, and authorized it to study and construct, if found feasible, a toll highway from Tacoma to Everett by way of Seattle. An appropriation of $500,000 was granted for the study and other preliminary costs.

West Virginia: State Turnpike Commission recently invited North Carolina and Virginia representatives to join in a survey of future highway needs "along a new major North-South route" of which the West Virginia toll highway now under construction would be the first unit. The invitation was extended at a meeting in Mt. Airy, N. C., at which a resolution was adopted calling for creation of a committee of three members of each state to supervise "a regional traffic survey centered in the three states but extending over the surrounding area."

The resolution said the anticipated growth of such traffic is of primary interest to Virginia and North Carolina "by reason of the expected concentration of traffic.

West Virginia is interested in the projected tri-state traffic survey in the belief that it might hasten the day for dualization of the West Vidginia Turnpike, now being constructed as a two-lane road.

Wisconsin: A bill enacted by the 1953 State Legislature provided for creation of the five-member commission to study and construct, if found feasible, a cross-state toll highway running from the Minnesota to the Illinois border. The act appropriated $250,000 for engineering surveys and other preliminary costs. The 287-mile project itself, expected to cost nearly $200,000,000, to be bond-financed.

W. A. Roberts of Milwaukee, president of Allis-Chalmers Manufacturing Co., wa selected chairman of the new turnpike commission at its opening meeting. As financing discussion began with investment bankers, a move was made to test the constitutionality of the toll road act, through a procedure expected to bring early court action.

★ Weak bridges are often brought up to higher load rating by judicious repairs of the floor system. (Left): Example of strengthening of the bottom chord of a truss with I-beams. All four corners of truss so reinforced. (Right): New floor beams here, and stringers and bottom chord strengthened in place. (Photos courtesy C. W. McCaughey, Ohio Dept. of Highways)

Ohio Still Has Problem of Old Weak Bridges

A CONDITION survey report compiled by the Ohio Department of Highways, Division of Maintenance, reveals that of the 9,000 state road bridges, 2,744 are inadequate in strength, 2,268 inadequate in both strength and width, and 1,537 strong enough but too narrow for safety.

Of these bridges 1,400 are posted for reduced load from the legal maximum for state roads, and 300 more were found to require posting, according to C. W. McCaughey, chief engineer of maintenance. 573 are posted for load reductions varying from 10% to 50% from the legal maximum, 342 for 50% to 65% reduction, 224 for reduction of 70% or more. Over 300 bridges were declared unsafe for school buses.

During the three years 1950-51-52 there were 142 complete bridge failures on the state system and 299 partial failures requiring closure for emergency repairs—due to flood, collision, overload, and in one or two occasions to fire (covered wood bridges.)

The Department inspects bridges annually and has a continuous program of repair. A heavy repair crew equipped with standardized equipment works in each of the twelve division offices, and skeleton crews supplement on light repairs in the various counties.

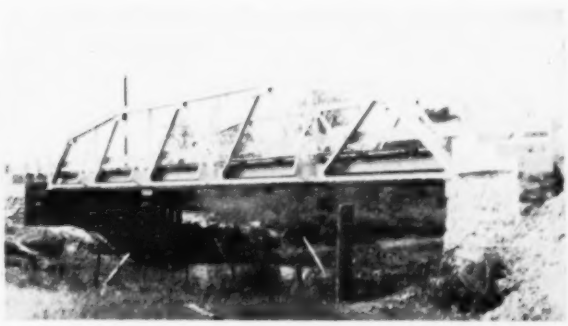
(Ohio's bridge repair methods were described in detail in an article, "Ohio's Emergency Bridge Methods," by L. F. Schaeublin, Assistant Director and Chief Engineer, Ohio Department of Highways; Roads and Streets, August, 1950.)

• New address of the American Road Builders Association is 918 Sixteenth Street, N. W., Washington 6, D. C. Phone Republic 7-5440.

★ Bridges are posted with prominent signs at each end and also at approaching road intersections

★ Example of new creek bridge replacing a failed structure. H-beam pier posts on concrete sills, supported on rock

★ Old truss moved to this site to make an emergency replacement



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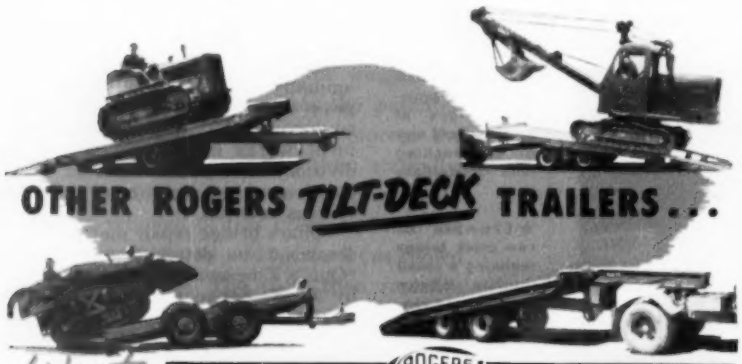
Extra Features in the
ROGERS
TILT-DECK-Plus
TRAILER

1. A rugged, balanced deck with beveled rear end to facilitate loading.
2. Two (2) hydraulic rams to cushion movement of the deck up or down.
3. A forward sub-deck to provide extra load capacity and stabilize the trailer by carrying part of the load on the truck-tractor.
4. Legs to support the front end when the trailer is not in use.
5. A substantial gooseneck with conventional fifth wheel which also provides extra space to carry a dipper or other equipment.



OTHER ROGERS TILT-DECK TRAILERS . . .

Write for the TILT-DECK TRAILER LITERATURE

EXPERIENCE builds 'em — PERFORMANCE sells 'em

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ALBION, PENNA. CABLE: BROSITES

110 Orchard St.

Divided bed, tilt deck trailer with gooseneck.

Thermic boring through reinforced concrete

Concrete and Constructional Engineering (London), Vol. 48, No. 3, p. 128, March, 1953. Highway Research Abstracts, June, 1953.

In drilling holes in reinforced concrete, difficulty is always experienced in cutting through reinforcement, and in many cases, the vibration and noise which accompany drilling prohibit its use. Thermic boring is a method of boring through reinforced concrete, stone, or similar material by the fusion of oxygen and iron, the temperature of which is sufficient to melt the material. In the case of concrete, the silica content becomes fluid and is carried away with the products of combustion, the presence of steel actually facilitating the process and the work being carried out without noise or vibration.

The equipment consists of three steel containers for oxygen connected by a manifold with pressure gauges from which the oxygen passes through flexible hoses to a holder into which is inserted a mild-steel tube filled with a number of soft-iron wires. The size of the tube and the number of wires are determined by the size of the hole required.

The point of the tube is first heated to a red heat by an oxyacetylene burner or some other method and oxygen is fed through it. The end of the tube then fuses and is applied to the material to be penetrated. The heat generated melts the material and the flow of slag is assisted by the molten metal. Holes can be bored horizontally or vertically up to about 15 ft. to 20 ft. long, but in boring vertically difficulty is experienced beyond a depth of about 10 ft., after which a special system for removing the slag is required.

The diameter of the hole produced can be varied by using tubes of different diameters, one of ⅝-in. producing a hole between 2½ in. and 3 in. in diameter. The speed of penetration for a horizontal hole of this size is about 1½ min. per ft., and 6 to 7 ft. of the tube and wires and about 23 cu. ft. of oxygen are consumed, but this depends largely upon the silica content of the material being bored. Larger holes, up to 4-in. diameter can be produced by tubes up to 1-in. diameter. For vertical boring, the consumption of the tube and wires and of oxygen is the same as with horizontal boring for a depth of about 8 ft., beyond which it increases to about 8 ft. to 10 ft. of tube and 30 to 32 cu. ft. of oxygen per foot of penetration.

Nordberg Promotes Grace. J. D. Grace, for the past 3 years manager of advertising and sales development, has been appointed sales manager, Screen Department of Crusher Division of Nordberg Manufacturing Co., Milwaukee, Wis.

Tuffy Makes Big Saving On Rock Crushing Job!

"Best Wire Rope Service . . . on 33 Draglines"

Says Superintendent of a Florida Rock Crushing Company.
(Name on Request)

This construction company learned, by actual in-use tests on 33 draglines in their plants, that Tuffy's extra flexibility, extra abrasive resistance and extra toughness helped cut dragline costs 40%! On their first test, Tuffy went 26 shifts against 19 shifts for another make . . . on the second test, Tuffy lasted 19 shifts, the other rope only 9! See for yourself how Tuffy Draglines can move more material for longer periods for *you!*

Mail Coupon for FREE Dragline Folder

UNION WIRE ROPE CORP.
Specialists in Wire Rope and Braided Wire Fabric
2200 Manchester Ave., Kansas City 3, Mo.

Please send FREE illustrated folder on Tuffy Draglines.

Firm Name_____

By_____ Title_____

Address_____

City_____ Zone____ State_____

C-15

Traffic up 24%, accidents down on N. J. turnpike

New records in traffic and revenue again were made by the New Jersey Turnpike in the three months ended June 30, it was reported by the Commissioners of the New Jersey Turnpike Authority to the bondholders. A further improvement also was shown in the highway's safety record in reflection of the installation of additional safety measures and an increase in the State Police detachment on the highway.

During the six months, accidents were equal to 60.1 for each 100 million miles of travel, the standard used by federal and state agencies. That rate compared with 90.9 in the 1952 first half. The accident rate on New Jersey's public highways for all of 1952 equalled 380 per 100 million miles, or more than six times that on the Turnpike.

Fatalities on the Turnpike in the June six months were 4.1 per 100 million miles, ranking with the lowest for five state highway systems in the nation. The Turnpike rate of 4.1 compared with 4.4 on New Jersey's public highways and with 7.3 on the nation's highways as a whole.

"Significantly, there was not a fatal accident on the Turnpike over the New Year, Lincoln and Washington's Birthdays, Memorial and Independence Day holidays," noted the Turnpike Authority. "On the nation's public highways, on the other hand, fatalities were at records over several of those holiday periods."

The scheduled step-by-step completion in the next few months of additional lighting on the Turnpike between the two major bridges crossing the Hackensack and Passaic Rivers in the north, in the Elizabeth dual-dual section, at the interchanges, service areas and other selected locations, should aid in further improving safety.

Commissioners Troast, Smith and Lester state that the stricter enforcement of Turnpike regulations by the detachment of State Police on the highway has been an important factor in the better safety record. This greater effort is evidenced by the fact that, in this year's first six months, a total of 7,822 summonses was issued compared to only 529 in the same period of 1952. Of this year's summonses, 6,347 were issued for speeding (in 1952 there were 310); 347 drivers who failed to keep to the right (against 18 in 1952) and 286 for careless driving (against 80). Summonses issued on radar checks totaled 1,307 in the five months to June 30 of this year.

With the abnormally heavy traffic on the Turnpike, the police have been called upon to render increasing aid to motorists whose vehicles break down, run out of gasoline or oil, overheat, or have flat tires, the Commis-

Tuffy®

Stops Dozer Rope Waste

A Reel of Tuffy Dozer Rope Can Save Up to 300%

When 10' or so of Tuffy Dozer Rope is crushed or cut on the drum, don't throw the whole rope away. Just feed through enough to replace the damaged part! When you're using Tuffy, there is plenty of service left in the undamaged part. You get 6 to 9 cuts from one reel and, figuring roughly, there are *two* dozer ropes to *each* reel of Tuffy. That gives you an approximate ratio of 6 to 2 . . . around 300% increased service! And you can have your dozer back on the job in less than *half* the time usually needed! Tuffy ½" Dozer Rope is now furnished in 150' reels. Write today for simple details on how to mount Tuffy on *your* Dozer!

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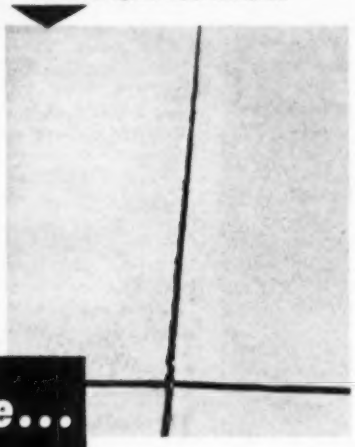
C-14

Old joint filled with a hot poured type sealer. Note cracks which permit water penetration through joint.

Tightly bonded joint uniformly sealed with cold applied Presstite No. 77, forming impervious barrier against water infiltration.



See the difference...

when paving joints are sealed with *Cold Applied* PRESSTITE No. 77

To reduce paving maintenance costs, resulting from havoc wrought by repeated expansion and contraction of pavement, Presstite's Research Laboratory developed a *cold applied* paving joint sealer . . . Presstite No. 77.

Proven on more and more highway and airport paving jobs, Presstite No. 77 has conclusively demonstrated its superiority for sealing joints in new pavement and for maintenance re-sealing. It remains flexible, resilient and adhesive, withstands repeated expansion and contraction of the pavement, and forms an impervious barrier against passage of water through the joints and into the sub-grade below.

Quick, easy and economical to apply, Presstite No. 77 remains tough and elastic under extremes of temperature and heavy traffic.

Here is a proven paving joint sealer that provides longer lasting, more satisfactory pavement service, resulting in greater maintenance economy.

WRITE TODAY for new catalog and full details on *cold applied* paving joint sealers.

Re-sealing runway paving joints at Davenport, Iowa, Municipal Airport. Presstite No. 77 is quickly and easily pumped under pressure directly from drum into joints.

PRESSTITE SEALING COMPOUNDS

PRESSTITE ENGINEERING COMPANY

3782 Chouteau St. Louis 10, Missouri

sioners add. Such aids in the first six months numbered 18,741, an average of more than 100 each day on the 118-mile road.

Another important function of the police, but incidental to their arrests for Turnpike violations, is the apprehension of criminals and the recovery of stolen property, including automobiles. For the first six months of this year, a total of 333 arrests was made for such "other" violations of the law ranging from armed robbery to kidnapping, illegal possession and transportation of guns and ammunition, alcohol, narcotics and cigarettes.

For the three months ended June 30, a total of 5,628,700 revenue vehicles used the Turnpike, or 21.8% more than in the same quarter of 1952. During the first six months of 1953, the traffic volume was 9,713,100 revenue vehicles, an increase of 24.9%.

Average daily revenue traffic in the first six months equaled 53,700 vehicles, more than twice the estimate of 23,900 forecast by the engineers. In recent summer weeks, moreover, traffic has averaged 76,700 vehicles a day. The Turnpike, based on traffic so far in 1953, is carrying the volume which the engineers forecast for 1971, or eighteen years from now. For all of June, 1953, a total of 2,048,300 vehicles was carried, a new monthly record.

Power Crane & Shovel Assn. Bulletin on Attachments

Available for distribution to contractor organizations, highway departments, libraries, colleges and others, is Technical Bulletin No. 4 of the Power Crane & Shovel Association entitled "Power Cranes, Shovels, Drag-lines — Attachments; Traction; Operation."

The bulletin contains sixty pages of valuable data covering the available front-end attachments for use with various types of excavators, their application, and their effective use. Numerous tables and illustrations are given, including considerable data on typical output capacity of various equipment under various conditions.

The price of the bulletin is $1.00 per copy except that complimentary copies are available to engineering colleges. Address Power Crane & Shovel Association, 74 Trinity Place, New York 6, N. Y.

• Only $10.35 per person was invested by the state of New York on highways last year. The total state road investment of $155,471,000 while seemingly a high figure is thus explained to citizens by the New York Good Roads Association, which has enlisted more than 500 other organizations in a drive to get increased appropriations for general highway development over the state.

Cleveland's traffic problem appraised by study

An impressive printed presentation entitled "Facing Up to Cleveland's Traffic Problems" has been presented to the City Council of Cleveland, Ohio. The result of a street and traffic management study by the Automotive Safety Foundation of Washington, D. C., as consultants, with D. Grant Mickle of the Foundation directing, this study appraises the problem, presents recommendations in a well pictured and documented manner.

The recommendations are summarized as follows:

1. Create by ordinance a Department of Streets and Traffic, consolidating all street and traffic management functions.

2. Establish as a staff agency in the new department a Division of Street and Traffic Planning to plan and program all physical and operational improvements.

3. Establish by ordinance within the new department a Division of Traffic and a Division of Streets, coequal in status.

4. Consolidate with the Division of Streets all construction functions in a Bureau of Design and Construction, a Bureau of Maintenance and a Bureau of Surveys.

5. Consolidate within the Division of Traffic all operational functions in a Bureau of Traffic Operations, a Bureau of Parking and a Bureau of Street Lighting.

6. Transfer to the new department all personnel and equipment now assigned to other municipal departments for performance of street and traffic duties.

7. Set up a single standing committee of the City Council to concern itself solely with matters pertaining to the functions of the new department.

8. Chart a broad program of operational improvements, such as modernization of the signal system, one-way street routing, etc., so as to provide maximum traffic relief during the years the proposed freeways are being built.

9. Develop and adopt a Master Street Plan.

10. Establish a Technical Coordinating Committee for the metropolitan area to promote collective action and a more unified approach to common traffic problems.

11. Develop a comprehensive transportation plan to integrate all forms of street transportation in Greater Cleveland.

Nut and Bolt Data. A new data sheet gives complete standard nut and bolt dimensions and thread data. Originally developed by the Murphy Diesel Company for the convenience of their own engineering department, it is now offered without charge to all interested persons. Address your request to Murphy Diesel Co., 5317 West Burnham St., Milwaukee 14, Wisc.

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PORTABLE POWER TOOLS

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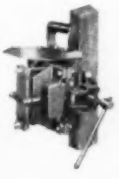
GASOLINE HAMMER ROCK DRILLS and PAVING BREAKERS

Heavy duty, completely self-contained units that deliver over 2000 fracturing blows per minute. Drill bit rotates automatically—one man operation for drilling in rock. Paving Breakers for cutting asphalt—digging clay, shale and frozen ground—tamping backfill. No air compressor or accessories needed.



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Assure uniform compacting and settling of concrete on countless construction jobs. Models available for light, medium or heavy form work. Motor driven, flexible shaft types for large mass vibration.

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Write for complete Tool Catalogue—FREE

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Homer City, Pa.

NO-TURN SHUTTLE HAUL

In confined underground operation, fast-shuttling Dumptors are ideal for no-turn hauling in tunnels and along narrow passageways. Also note how low rear entry to Dumptor body permits easy loading under low ceiling. Compact body is 8' x 8' for loading over end or sides.

This mountain-side job shows typical no-turn shuttle advantage. Hauling along narrow ledge, Dumptor spots close to Koehring 1½-yard 605 — gets its load, drives to fill, dumps, and returns to the shovel — without turning. Dumptors are operated with equal ease in both directions. 5255

increases hourly output over 10%

With Koehring fast-shuttling Dumptors, there is no need to turn at the loading unit, along narrow haul roads, or at the dump. Koehring constant-mesh transmission gives the same 3 fast speeds forward and reverse. Every turn saved cuts 15 seconds off your cycle time, and adds up to a big increase in yards hauled per hour.

On a 1,000-foot haul, eliminating only 2 turns saves ½ minute every round trip. Where you would get an average of 13.6 trips per hour with 2-turn operation, Dumptor *no-turn shuttle hauling* gives you 15.4 trips. That's an increase of 1.8 trips an hour on the same, 1,000-foot haul.

Fast, easy spotting and 1-second gravity dump also help keep production high. Your Koehring distributor can show you many other cost-cutting advantages with heavy-duty, 6-yard Dumptors.

KOEHRING COMPANY, Milwaukee 16, Wis.

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Subsidiary Companies: JOHNSON • PARSONS • KWIK-MIX

ARBA issues new highway directory

The 1953 edition of ARBA's convenient pocket-sized directory of "Highway Officials and Engineers" is off the press. This directory contains 1600 names, titles and addresses of administrative engineers and officials in the 48 state highway departments, the District of Columbia and the Bureau of Public Roads.

An added feature of the new directory will be a listing of the administrative personnel of all toll road authorities now organized and functioning in the various states, and a complete listing of the officers and directors of ARBA and its organized divisions.

Available at $1.00 per copy. Address American Road Builders Association, World Center Building, Washington 6, D. C.

Lower compensation rates reported in Pennsylvania

The Compensation Insurance Rates for 1953 have just been released by the Pennsylvania Compensation Rating and Inspection Bureau. With three exceptions in the eleven classifications listed below, the rates have decreased as compared with those paid in 1952, according to a report to member contractors by the Constructors Association of Western Pennsylvania.

CODE NO.	1936	1952	1953
601 Roads & Streets	7.00	2.10	2.10
603 Sewers	9.75	2.75	2.40
605 Railroads	7.00	1.90	1.95
607 Drilling	6.00	2.45	2.35
609 Excavation	5.50	1.65	1.45
611 Pile Driving	9.00	3.15	2.75
615 Tunnels & Shafts	12.00	4.65	4.25
653 Masonry	4.45	1.05	.95
654 Concrete Construction	7.50	1.50	1.40
655 Iron Erection	15.00	4.30	3.85
713 Dredging	3.85	2.75	3.40

This decisive drop in rates is credited to the long and vigorous safety programs by contractor groups among member company principals, superintendents and foremen.

GOOD EXAMPLE

APSCO Model 95 Widener speeds the road widening and asphalt paving contract in Cambria County, Pa. (Putnam & Greene, Inc., Philipsburg — Contractors.)

Companion piece, APSCO DTR-552 Trench Roller, with adjustable width rolling design, is, in effect, two rollers in one. Can cut by one half, the usual time required.

Photos—Courtesy CONSTRUCTIONEER

TEAM WORK-RESULTS

Few contractors can afford to overlook the economy and time-saving features of APSCO road widening equipment. Wideners, Base Pavers, Trench Rollers, Tandem Rollers are seen more and more around the country as more and more contractors see the good examples of team work and results. More information is yours for the asking.

ANTI-SKID CONTROL—Send for specifications and prices on this effective traction producer.

APSCO

ALL PURPOSE SPREADER COMPANY
ELYRIA, OHIO

Texas department given $51 million for state road upkeep and repair

The sum of $28,550,000 has been allocated by the Texas highway commission for a year's maintenance of the 43,725 miles of State roads. This covers the fiscal year beginning September 1, 1953. Approximately $17,000,000 is for upkeep on the State Highway System and $8,000,000 for the 18,000-mile State Farm to Market Road System. A large additional farm-to-market mileage is under construction and will be placed under state maintenance as rapidly as construction is completed.

An additional $22,500,000 is allocated for "heavy maintenance," running the total road upkeep bill to approximately $51 million or 7% more than the previous year's allotment.

"Public Safety Communication Systems" a complete register

Mobile and point-to-point systems operated by municipal, county, state, zone and inter-zone police; fire departments; special emergency units; highway maintenance departments; and forestry conservation units are listed alphabetically by states, cities and counties. Information includes call letters, number of mobile units, frequencies, and make of equipment used. All stations registered with the Federal Communications Commission are included. Edition of June, 1953 published by Communication Magazine, Great Barrington, Mass., Price $1.00. Next edition to be June 1954.

• **Frank S. Maddox,** assistant state highway engineer of Texas, has resigned from the highway department after 33 years of service to enter a commercial firm in the highway field.

Turnpike users to be informed on driving conditions

The Pennsylvania Turnpike Commission has taken another significant step in promoting safety, convenience and comfort for the millions of users of the famed superhighway.

Chairman Thomas J. Evans announced that a contract has been signed for radio spot announcements to "promote safe driving, inform and educate the driving public concerning Turnpike rules and regulations and prepare for winter weather and road condition bulletins" for the next year.

Beginning with winter weather and the difficult driving season, about November 1, the daily announcements and all-night facilities of WCMB (Harrisburg) will headline road condition and weather reports.

Michigan begins undersealing

The Michigan state highway department has given the technique of undersealing concrete pavement slabs with bituminous materials a test try. The method, which has been widely used in numerous other states, is in accordance with prevailing standards. Missouri Petroleum Produce Company of St. Louis was awarded a contract to treat pavement sections on U. S. route 24 near Flat Rock, requiring a total of about 100,000 gallons of liquid asphalt, placed at 400 degrees F.

The contract price for material in place includes twenty cents per hole and twenty-five cents per gallon, with about 12,000 gallons daily being pumped into place.

Jensen Heads Porter-Cable's New Export Department. The Porter-Cable Machine Co. of South Haven, Mich., maker of portable electric saws, sanders, planes, grinders, and other tools, has announced the appointment of John C. Jensen to head its newly established export department. Headquarters will be in South Haven. The announcement is made as the first step in a campaign to promote worldwide sales of Porter-Cable products. Industrial and commercial recovery, extension of electric power facilities, and improved financial conditions in all free countries are assigned as major reasons for the step. Mr. Jensen has had more than 15 years of export sales and promotional experience.

J. C. Merwin and L. B. McKnight Head Chain Belt. Two executive charges were announced in August by Chain Belt Company of Milwaukee. J. C. Merwin has been elected by the company's Board of Directors to the position of Chairman of the Board. L. B. McKnight was elected to succeed Mr. Merwin as President and Chief Executive Officer of the company. Chain Belt Company has manufacturing plants in Wisconsin, Massachusetts and Illinois. Currently the company is building a plant in the Los Angeles area which will provide facilities for district sales office, warehousing and manufacturing certain products.

Soil auger bores 2 ft. diameter holes

In England the road research laboratory of the road research board has developed a mechanical auger for investigating sub-soil conditions, particularly where stone or gravely strata are encountered. The machine has successfully bored holes up to 2 ft. in diameter to a depth of 16 ft., in a wide range of soils, and has aroused considerable interest both in England and abroad because of its practical applications in many branches of civil engineering, and in other scientific studies.

• **Everett C. Crites** has been appointed a Regional Highway Engineer of the Portland Cement Association. He will be available to assist engineers on practices for concrete roads, streets and airports in the states of Missouri, Iowa, Minnesota, North Dakota, Montana, Kansas and Nebraska.

• **James W. McKnight** is appointed to a similar PCA post serving Delaware, Maryland, Pennsylvania, Ohio and West Virginia. He succeeds W. J. McIntosh, who recently was promoted to District Engineer in charge of the Association's New York Office.

Above, a 2½-cu. yd. Crescent scraper is used on a 1-cu. yd. boom dragline and the yardage rises to 270 cu. yd. per hour. The scraper is taking gravel from a roadside pit and delivering to a movable truck loader.

In this picture a Crescent scraper hangs from a trolley that rides on a slack cable extending from the tip of the boom to an anchorage across the river. Thus, it is able to excavate far beyond the reach of the boom and haul material onto the bank.

A Sauerman Crescent Scraper will repay its moderate initial cost many times over when added to your boom machine as auxiliary equipment. Simple to rig up, it increases the machine's capacity when used on specific job operations mentioned below.

For backfilling, grading and other jobs where material must be moved but not lifted, the conventional casting method is used. The Crescent bites into and gathers the load with the ease of a plowshare, then hauls at ground level and deposits the load automatically when the forward pull is reversed. Machine strain and power consumption required to lift and swing the load to the discharge point are eliminated.

To dig material from a river, deep pit or soft area beyond the reach of the boom, another method is used to rig the Crescent Scraper to the boom machine. For such work the Crescent is suspended by chains from a simple trolley that rides on a track cable extending from the tip of the boom out to a movable anchorage. Digging, hauling and discharge proceed as in the casting opertaion. Following discharge, the empty scraper is lifted and gravity-returned to the excavation point merely by tightening the track cable.

Any boom machine will handle a Crescent of larger size than its regular dragline and clamshell bucket. The Crescent is much lighter, size for size, than these buckets. Digging power and strength are derived from the Crescent's bottomless construction and flowing lines—not from weight of metal. Users of boom machines can obtain full information by writing for illustrated literature describing how other operators use Sauerman Crescent Scrapers on their machines to increase output and reduce costs.

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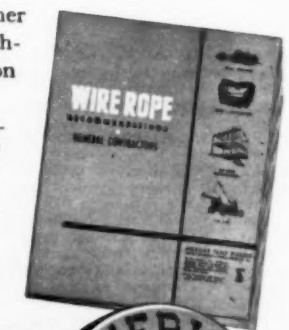
TRU-LAY Preformed WIRE ROPE

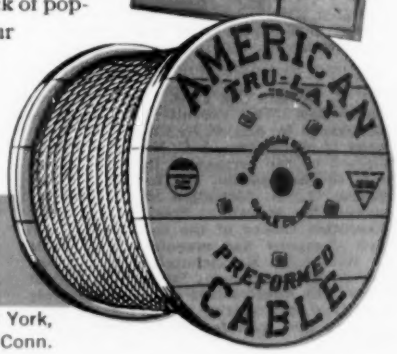
Should Boom and Hoist Lines Be the Same Construction?

● Yes, if you use a tag line. No, if no tag line. Maybe you, like some other contractors, are still using 6 x 25 filler wire construction for the hoist line without a tag line and are having trouble with spinning. It's pretty common practice.

AMERICAN CABLE gives the simple solution to this irritating, and expensive, trouble in "Wire Rope Recommendations for General Contractors." Here is a 16-page book that gives you factual information based on service records maintained by American Cable's engineering staff for many years. It covers recommendations you can depend on for every type of equipment you operate.

See your nearby AMERICAN CABLE distributor who carries a stock of popular TRU-LAY Preformed GREEN STRAND Wire Ropes. Or write our Wilkes-Barre, Pa., office for a copy of No. 128-B "Wire Rope Recommendations for General Contractors." It will save you money.





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TRADE MARK

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Bituminous ROADS AND STREETS

Cover Scene

Paving crew placing asphalt mix containing natural rubber on New York City's First Avenue. One of numerous street sections being paved with rubberized asphaltic mix this year on try-out basis. (United Press Photo)

Published by asphalt planning conference
[illegible]

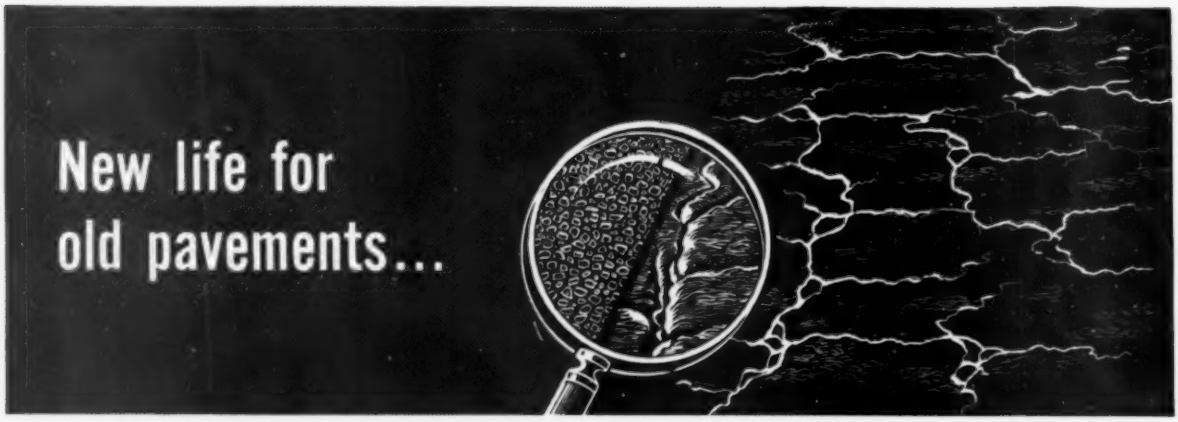
Bituminous Concrete Surface Mixtures—Indiana Design Studies

Major Replacement of Street Surfaces in Mt. Morris, Ill.

Twin Dryer Hook-up with Special Drives

SEPTEMBER, 1953

B I T U M U L S I S V E R S A T I L



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In addition, there is a Bitumuls Surface Treatment (whether Single, Double, or Triple) to meet every type of surfacing problem. Worn, cracked or uneven pavements can be smoothed and sealed; and unsightly patched areas can be made uniformly attractive. On new construction, the life of the pavement can be greatly extended by a Bitumuls Seal.

Bitumuls Surface Treatments are easy and economical to apply. For detailed description of each type send for the new illustrated Bulletins: "Surface Treatments and Penetration Pavements" and "Bitumuls for Maintenance."

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Quick-Setting Grades of High Viscosity Bitumuls are designed for Surface Treatments and Medium Viscosity for Full Penetration Pavements; Mixing Grades for use with fine or coarse aggregates. All grades are available for prompt on-job delivery from plants conveniently located.

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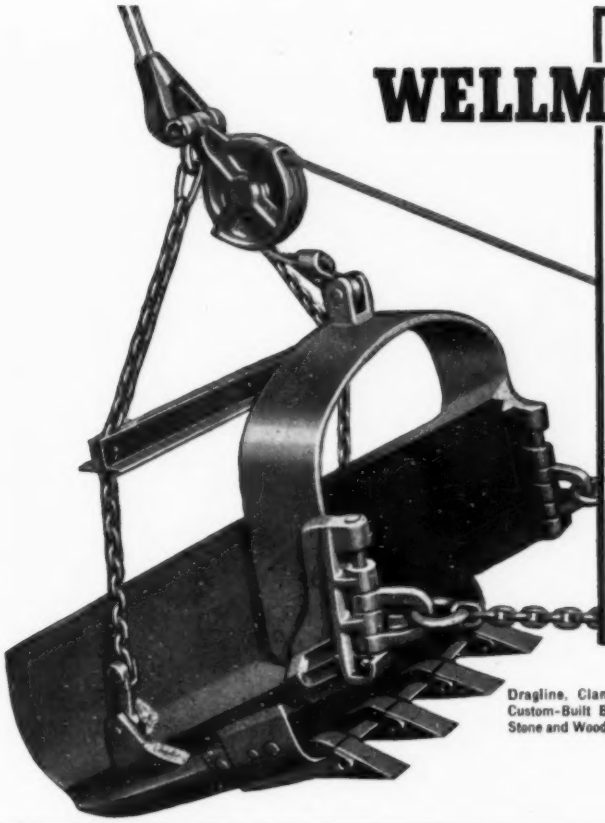
Inglewood, Calif. Oakland 1, Calif. Portland 7, Ore. Washington 6, D. C. San Juan 23, P. R.



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● Elimination of excess materials and careful weight distribution permit rapid, rhythmic operation of Wellman Dragline Buckets. Operators can cover a wider digging radius with this streamlined bucket.

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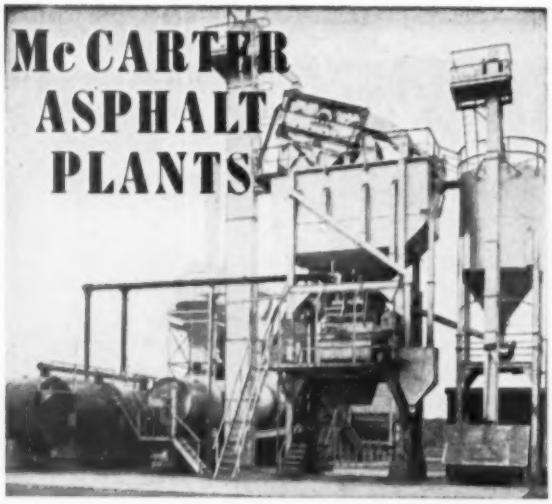

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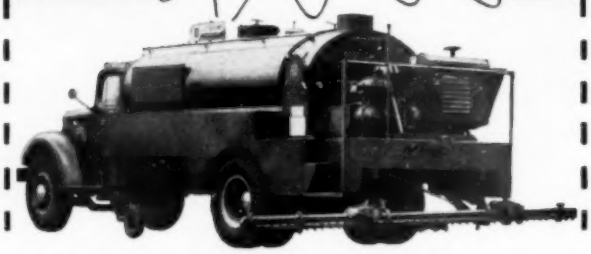

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3 EFFICIENT OPERATION—is offered to Contractors and Highway Departments because the "Spray-Master" was designed to give accurate spraying under all conditions and at low cost. To this end the "Spray-Master" has feature after feature eliminating excessive labor. Each operational function is simple and efficient speeding up the application of Bituminous materials on Construction and Maintenance Jobs.
Littleford "Spray-Master" Distributors are made in Truck Mounted and Semi-Trailer Models ranging in size from 800 to 4000 gal. Send for Bulletin 14 for details.

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TARMAC resists the stripping action of water . . . even withstands the softening effect of gasoline and oil drippings.

You can speed up construction work with TARMAC because it penetrates quickly, cuts through dust or moisture films readily, mixes easily with local aggregates and adheres firmly.

• Easy-to-apply KOMAC premix is the answer to your patching and resurfacing problems. Regardless of the weather—rain or shine, hot or cold—you just sweep out the hole and fill it with KOMAC premix. Compact it thoroughly, then open the road immediately to heavy-duty, continuous traffic.

One of the distinct advantages to remember about KOMAC is that it may be stored for a year or more without losing its easy workability. And it *pays* to stockpile KOMAC; as you know, road surfacing materials aren't always available in emergencies. But when you've got KOMAC on hand, you just shovel it into trucks and you're ready to go. It won't stick to shovels, truck beds, or spreading equipment.

Investigate KOMAC premix. Get your supply of it before the cold weather sets in, and you'll have it *when* you need it. For complete information, write today for our free booklet.

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Tar Products Division

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CAT* power helps Farnsworth stay ahead of schedule on Memphis sewer project

R. P. Farnsworth & Co., of New Orleans, has a $1,500,000 contract for laying a 60-inch main sewer, 10 miles long, for the City of Memphis, Tennessee. Average depth of the floor line is 20 to 30 feet, and the soil is largely gumbo.

Though the contract calls for completion in 1955, the company expects to finish ahead of time. Says Superintendent Thomas B. Sellers, Jr., "We have a lot of Caterpillar equipment, and it's good equipment. It stands up well and can be depended on."

There are three excavators on the job, all powered by Cat Engines. A D17000 swings the boom of a Lima 3½-yard dragline, a D13000 powers a Lima 1½-yard clamshell, and in a Koehring 1-yard dragline there's a Cat D318. In addition, Farnsworth uses three Caterpillar track-type Tractors and a No. 12 Motor Grader. There are definite advantages in standardizing on the big yellow equipment. Simplified maintenance, operator familiarity, and fast parts and repair service from a single dealer—all contribute to more production with less down time.

Fuel economy is an added benefit. The D17000 Engine, for instance, delivers an honest 200 HP on intermittent duty. Like all Caterpillar Engines it operates on low-cost No. 2 furnace oil without fouling, even at idling speeds.

Leading manufacturers can supply Caterpillar power in their equipment. For replacement engines see your Caterpillar Dealer. He has 12 sizes available up to 500 HP; electric sets to 315 KW.

Caterpillar Tractor Co., Peoria, Illinois.

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SPECIFY CAT POWER FOR HIGH-PROFIT PRODUCTION

VIEWS AND COMMENTS

By H. G. Nevitt

Every Man Must Have His Creed

None of us asked to be born and most of us wish that life would flow smoothly without too many problems. In fact, a few individuals manage to live their days without much concern about what is going to happen next or any plans or need for thought about their future.

The thinking man is inclined to envy such individuals despite their usual failure to achieve much material or other success. He finds life full of problems, and decisions as to the future difficult to make. Almost invariably he ends up with some basic philosophy on which to base most of these decisions. This may include a creed for personal action and, in addition to basic knowledge of his vocation, a similar creed for the conduct of his business, reflecting the essential things that he feels he must adhere to regardless of the daily routine and stresses that it produces.

A good example of such a business creed was brought out by Mr. McKeever's recent interview with Thomas H. McDonald.* It showed Mr. McDonald has realized certain basic needs in the development of highways and highway engineering, and how he has tried throughout his numerous highway activities to see that these fundamentals were not forgotten.

Words and Deeds

Of course fundamentals are often preached, and lip service given to them, without much real attention to the basic action they call for. In the utterances of almost all of us some predictions for the future could be found regardless of whether the facts show much attention was paid to them. Mr. McDonald of course is fortunate that his actions have followed up his utterances. The record shows that he hewed closely to the line in these fundamentals, as the basic highway system of the United States gives evidence.

Incidentally anyone who does not appreciate this situation should look at the highway systems of countries which were established before the pattern was set here. He will realize how much we have gained from a more or less consistent over-all program, limited though it may be as compared to our needs.

It seems to us that there is particular need of such a creed for the highway engineer—one that each man establishes for h's particular situation and other factors. He is subject to many pressures and the demands on his knowledge cover a wide field. He can easily become confused or inconsistent in his actions without some central guiding principles. These will not of course prevent him from making errors of judgment as viewed with the benefit of hindsight; but they will keep him to a considerable extent on a consistent path, and assure him that most of his activities in the end will be fruitful and toward the objectives he has set.

Our suggestion as to certain such items for the highway engineer's creed may be of interest. We believe the following should not be omitted.

1. His primary function is to satisfy our transportation needs, not build structures. As Mr. McDonald has stated it, "The highway engineer must recognize . . . that the purpose of highway engineering is to move people and goods quickly and safely." The traffic problem is probably the most difficult physical one faced by our present civilization other than that of international peace and fair dealing. It impinges on our daily activities, jeopardizes their very safety, and is tending to change our whole way of life.

The highway engineer needs to make his contribution to the team which must solve these very serious problems. And to do so he must have the over-all viewpoint. He often occupies the difficult position of having to cut the Gordian knot between meeting the needs of today and the probabilities of the future. If he will keep the over-all objective in mind he will do a better job than by taking the attitude that he merely needs to build the structures which administrative or other bodies have decided represent the best solution. His very presentation of what may be done to solve the problems will often be the most influential factor in the decision; he can not best make such presentations without always remembering, as well as understanding, the fundamentals involved.

2. He must remember that his function as an engineer is the proper expenditure of funds. They are the hard-won savings or earnings of others. His job is to get the most from them. Naturally he wants to use his engineering skill to the greatest degree in so doing; but he must avoid making the means the important thing rather than the end, which is to give the road users the most for their limited funds in this day of pressing need for highway facility improvements.

Avoid Blind Rules

3. He must remember that the basic function of an engineer is to apply his knowledge to the situation to get the best result, rather than to either set up or follow blind rules. Standards, and procedures according to standard methods, are of course helpful tools and should be resorted to in the maximum degree. However, in the final analysis, every job and every decision may require individual consideration; the work should be so organized and handled that this can be done. Maximum results imply intelligent consideration of the situa-

* Mr. Highway—Roads and Streets, May, 1953.

tion at every phase in its development. This is the duty of the engineer.

4. He must be open minded, impartial and progressive. Highway engineering—in fact, almost all highway decisions—demand greater knowledge than is usually available to any one individual; he needs help from others. He must get expert guidance, delegate decisions to competent experts when such is necessary, and meet the decisions which are forced upon him rather than try to temporize or avoid them when they are difficult. Lack of action or the refusal to adopt new ideas is probably penalizing the highways of our nation as much, if not more, than rash and undeveloped new methods. The evils of bureaucracy are more apparent and less justified in highway work than almost any other field.

5. He must above all maintain his integrity. In the nature of things, few men will amass wealth in strictly professional activities. The number is so limited that they may be considered almost exceptions.

It is of course true that competent professional men will probably be sufficiently well rewarded, so will not seriously lack the material advantages of our life. But they can not expect to be wealthy. Of course, many such men will acquire wealth by merely using their profession as a stepping stone to some other occupation, such as a corporation executive. But this discussion does not concern them since they have for all practical purposes given up their professional status.

Life's Rewards

The average engineer must therefore accept the fact that his principal reward in life will be the proper conduct of his professional affairs and the sense of satisfaction that such competency and achievement bring. Certainly those who sacrifice their professional integrity for political advantages—or let perfectly proper and legitimate attentions from commercial interests in the highway field grow into ill-disguised bribes—will find out that in the end these give them negligible material advantages, yet jeopardize their whole career and feeling of satisfaction otherwise.

This satisfaction is a really worthwhile thing. We have had the opportunity to see, and in some cases closely associate with, men who have achieved considerable prominence in other fields. We think they all lack something. The man who has gone out for power finds that gratitude for his achievements is notoriously lacking. He is forced to constantly strive to hold his position. Men of wealth find that it buys them little permanent pleasure; and most of them fall back on the satisfaction of having supplied the means whereby creative men, such as engineers, have been able to provide things for society.

The satisfaction of creative work and achievement is the one solid and enduring element in a man's work. The engineer generally has it continually and in large measure. He perhaps should be envied by the artist, who must usually suffer and struggle a great deal in order to satisfy the creative instincts with which he is born. If the engineer has this professional integrity the other parts of his creed will not present too many problems—although at times he will feel that this is not the case.

This is the day of the engineer. While the price he pays may be high, he can look at the world around him and feel that it is primarily a better one because of the substantial achievements by his profession—which are equal to, if they do not exceed those of any other group in our society.

Asphalt Institute Appoints Wellborn Chief Engineer

Bernard E. Gray, President of The Asphalt Institute, has announced the promotion of Arvin S. Wellborn, formerly Managing Engineer of the Pacific Coast Division of the Institute, to be Chief Engineer of the Institute, with headquarters at 801 Second Avenue, New York 17, N. Y.

In this post, Mr. Wellborn will assume direction nationally of a rapidly-growing engineering staff promoting the use of asphalt for roads, streets, and airfields, and developing requisite research for these and additional uses.

Mr. Wellborn's long career in the engineering field, both as civilian and Naval officer, admirably equips him for his new position. Following his course at the University of Arkansas Engineering School, he was first employed by the Arkansas Highway Department in the Department of Materials and Tests from 1933 to 1940. There his last position was as Soils Engineer, pioneering in the work in asphalt soil stabilization.

After employment with an asphalt pavement construction firm as Chief Engineer and Assistant Manager, Mr. Wellborn entered the U. S. Navy in 1942, serving in the South Pacific, Alaska, and Washington State, with the rank of Lieutenant Commander. Following a brief period in general contracting, in 1947 he was employed by the Navy as Engineer in Charge of Design and Construction of Airfields in Cuba, resigning in August 1949 to head The Asphalt Institute's Pacific Coast Division.

Mr. Wellborn is a Registered Professional Engineer and his membership affiliations in technical and other associations include the American Society of Civil Engineers, the American Chemical Society, and the American Road Builders' Association.

Arvin S. Wellborn

"Rubber road" mix tried in New York City

As shown on the Bituminous Roads and Streets cover illustration this month, a section of street in New York City was recently surfaced with a bituminous mix containing powdered natural rubber. The job consisted of a single block on First Avenue, between 24th and 25th Street, selected as a test section because of the heavy traffic.

The surfacing material was placed over an old granite block pavement. About 0.4% by weight of powdered rubber was added to the asphalt mix at the plant. This added rubber cost about $700 of the $2700 total cost of the section, according to a newspaper account quoting P. L. Stevens, of the Borough of Manhattan.

According to Harry K. Fisher, road consultant to the Natural Rubber Bureau in Washington, D. C., this test section is part of a nationwide sampling operation that has now spread into 19 states and four Canadian provinces, as well as various places abroad. A similar test of natural rubber additive, as well as of other types of rubber, such as synthetic and reclaimed, has been under way for more than two years on a curve of the West Side Highway in New York City.

Special Drives, Twin Dryer Hook-up

—Features of this Asphalt Plant

RECENTLY in expanding and modernizing their long-established asphalt plant at Tampa, Florida, the Tampa Sand and Materials Company incorporated several unusual features. This company supplied paving materials for local street and road work, and for nearby airfields, from a plant consisting of a Cummer unit and other equipment of various manufacture. Both hot and cold mixes have been produced.

The enlarged plant, which can produce up to 60 tons per hour of cold mix or 100 tons of hot mix, today includes the following elements:

1. Two pairs of 40 or 50 ton cold bins are located along the rail siding, adjacent to stockpile areas which consist of lime rock, screenings, slag, sand or other aggregates. A 300-ton silo is also provided for storing dried graded aggregate, ready for running through the pugmill for cold mix.

2. Two dryers are hooked up in tandem, each with bucket elevator. The first dryer is a twin 48-in. Barber-Greene unit (wartime model). So-called cold mix aggregate is dried in this unit at 300 to 325 degrees, then passes up the second elevator into a second dryer consisting of a 90 in. inside diameter x 30 ft. barrel. This barrel, equipped with a 47,000 cf. Buffalo fan with 50-hp. electric motor, is run with burner turned off thus knocking the aggregate down to 100 to 140 deg. as it passes over the baffles. This dryer is a contractor-built unit.

In producing hot mix, aggregate is run through the latter dryer only, with the burner operating.

3. The larger dryer and the elevator feeding it are equipped with drives designed by the contractor. These drives have contributed to a saving in power cost according to a company spokesman. The drum is operated by two 25-hp. electric motors, instead of one motor which ordinarily would be a 60-hp. unit working through gear reduction and jack shafts. The 25-hp. motors have identical power curves, and are connected with a single magnetic starter switch, so that both motors stop if either motor goes out for some reason, thus protecting the remaining motor from overload. There are two separate magetic kick-outs thus controlled.

Each motor delivers power to the trunion roller through a fluid Twin-Disc coupling or drive. This drive, which is designed to operate best at high speed, is mounted directly on the motor. The use of this device was worked out by the contractor's plant men with the cooperation of a local supply house for Twin-Disc equipment.

The drives not only protect the entire mechanism from shock, and thus add to service life, but they also cut electric power use. The two motors pull at a combined output of about 42 hp., according to ammeter readings converted to equivalent horsepower.

4. The bucket elevator supplying the large dryer also has a new drive. Power comes off the motor through a Dodge Torque-arm reducer mounted on the head shaft of the elevator. This fluid-type drive takes shocks such as might occur from a piece of wood or other obstacle getting wedged between feeder and bucket.

5. Dodge-Timken bearings have been installed extensively throughout the plant, effecting a further saving in power requirements. The plant, incidentally, is equipped with a total of 260 hp. of combined electric motor capacity (440 v.) plus another 100 hp. motor capacity for compressed air. Several makes and types of motors are represented, the plant man utilizing the best motors locally available at the time of purchase.

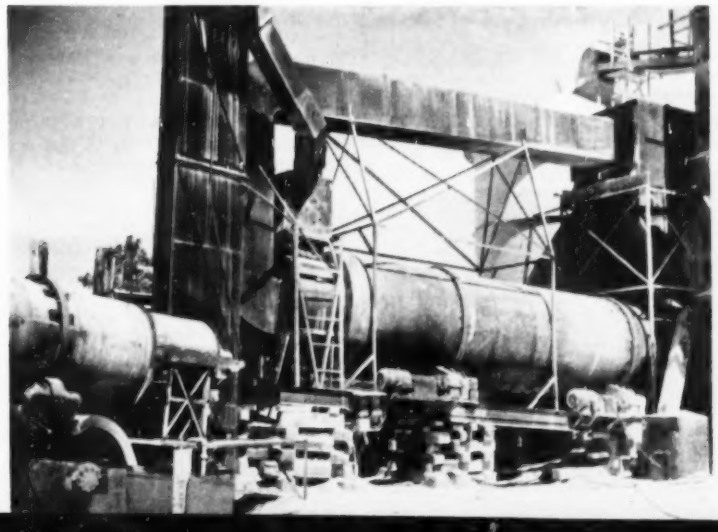
The plant equipment includes a Lucey 150-hp., 350 psi. steam boiler. A Permutit water softener is considered an important adjunct.

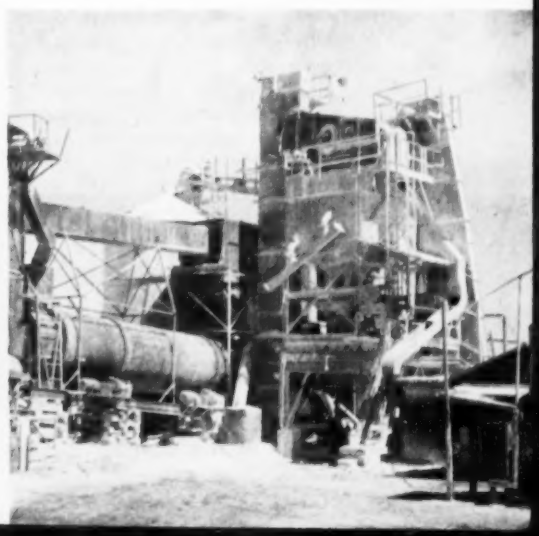
Mathew Tamplin is in charge of the plant for Tampa Sand and Materials Company, and John Conner is plant foreman.

Thor Moves Buffalo Branch Office. The Buffalo, N. Y. branch office of Thor Power Tool Co., Aurora, Ill., has been moved into a new building at 735 Military Road, Buffalo. The office is under the direction of C. T. Connolly.

Jim Moore Made District Representative. J. Irwin Moore, formerly district representative for Shepperd Diesel Co., Hanover, Pa., has been appointed southern states district representative for Baker-Lull Corporation, Minneapolis, Minn.

★ The two electric motors with special shock-absorbing drives are pictured here, together with a general view of the Tampa firm's plant





McConnaughay EMULSIFIED ASPHALT PLANT MIX
For Stock-Piling or Immediate Use On Any Paving or Patching Job

Above—Dense-Graded Plant Mix, Specification No. 4 (with Emulsified Asphalt AES-3), produced and stock-piled at Terre Haute, Ind. Left—Dense-Graded Plant Mix, Specification No. 4 (with Emulsified Bitumen ERA), U. S. highway in Massachusetts.

With McConnaughay Emulsified Asphalts and either damp or dry aggregates, these mixtures may be prepared either hot or cold. They may be either open-graded or dense-graded types . . . with the use of limestone, slag, trap rock, gravel, shell, sand, or any combinations of these materials.

The same mixtures may be made cold for stock-piling or immediate use in extensive paving or smaller maintenance jobs. In either case, they are highly resistant to water during the preparation and after application. Proper selection of aggregates and Emulsions also gives you assurance that stock-pile mixtures will remain fully workable for long periods . . . up to twleve months.

McConnaughay Licensees are fully equipped to take on complete contracts or provide the laboratory facilities, Emulsions, and technical services required on any job. If you are figuring on road, street, or general paving, get in touch with the nearest McConnaughay Licensee (list at right) or contact the main office.

SPECIFICATIONS OF THESE COLD-MIX PROCESSES AVAILABLE ON REQUEST

1—Penetration Macadam, 2—Open-Graded Plant Mix, 3—Open-Graded Road Mix, 4—Dense-Graded Plant Mix, 5—Dense-Graded Road Mix, 6—Mat Coat, 7—Seal Coat, 8—Sand Mix, 9—Sand Honing, 10—Patching.

McCONNAUGHAY LICENSEES Operating K. E. McConnaughay Emulsified Asphalt Plants

Ronald Kenyon Construction Co.
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C. C. Plumb, Elmwood Station
Providence 7, *Rhode Island*

Seaco, Incorporated
Columbia, *South Carolina*

C. C. Plumb
Hartford, *Connecticut*

Asphalt Products Co., Inc.
Nashville, *Tennessee*

E. A. Mariani—Emulsified Asphalt
Tampa, *Florida*

Emulsions, Inc.
Lawrenceville, *Illinois*

Walsh & Ikeler
Gary, *Indiana*

Ready-Mix Asphalt, Inc.
Fort Wayne, *Indiana*

Fauber Construction Co.
Lafayette, *Indiana*

Brookman Construction Co.
Muncie, *Indiana*

Bituminous Materials Co.
Terre Haute, *Indiana*

Wabash Valley Asphalt Co.
Terre Haute, *Indiana*

Asphalt Materials and Construction, Inc.
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Pan-Am Southern Corporation
New Orleans, *Louisiana*
(Also serving Alabama and Mississippi)

Doherty and Swearingen Co.
Yarmouth, *Maine*

Berkshire Asphalt Co., Inc.
Springfield, *Massachusetts*

James Huggins & Sons, Inc.
Malden, *Massachusetts*

Bituminous Materials Co.
Jackson, *Michigan*

Midwest PreCote Co.
Kansas City, *Missouri*

Albany Asphalt & Aggregates Co.
Albany, *New York*

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DESIGN STUDIES OF INDIANA

Bituminous Concrete Surface Mixtures

The design procedures of the Corps of Engineers involving the Marshall test are considered in relation to mixtures specified by the Indiana Highway Commission. The authors discuss difficulties due to the difference in types of mixtures involved, and suggest a modified design procedure.

By W. H. Goetz
Research Engineer
and J. F. McLaughlin
Research Assistant
Joint Highway Research Project
Lafayette, Indiana

FOR several years, the bituminous laboratory of the Joint Highway Research Project has been concerned with the testing of bituminous-aggregate mixtures and with the development of knowledge that would lead to an understanding of the properties of bituminous mixtures as satisfactory paving materials. At the Thirty-Eighth Annual Purdue Road School, a paper entitled, "Role of the Laboratory in the Design of Bituminous Mixes," was presented which included test data from the laboratory for the evaluation of a number of mixture variables including aggregate gradation, asphalt content, grade of asphalt cement, aggregate type, and testing speed (1, 2).*

In this testing program two types of tests were used, the triaxial test and the Marshall test. The triaxial test is a rational one from which fundamental strength properties of a material may be obtained. This test has been found to be very useful as a research tool, but it is not well adapted for use in the field either as a means of designing or controlling a bituminous mixture. For such use, the Marshall test has advantages of simplicity and convenience.

The apparatus used in the Marshall test is shown in Figure 1. The specimen is a cylinder 4 inches in diameter and 2½ inches high. A unique feature of the test is the method of loading the specimen. Unlike most compression tests, the Marshall specimen is loaded on the cylindrical surface rather than on the plane faces. The data normally obtained from a test of this type are the total load at failure (stability) and the total deformation of the specimen at failure expressed in hundreths of an inch (flow).

*Numbers in parentheses refer to References listed at the end of this paper.

Presented at the Thirty-Ninth Annual Purdue Road School, April 6-9, 1953.

Since comparable mixtures were tested by these two test methods, there was an opportunity to evaluate the test properties measured in the Marshall test in forms of the fundamental properties obtained from the triaxial test. One of these properties, the angle of internal friction, largely determines the stability or supporting power which a bituminous mixture will be capable of mobilizing under many conditions of loading.

The most pertinent fact revealed by this comparison is shown in Figure 2, which is a plot of angle of internal friction (degrees) versus Marshall flow (3). Twenty-two cases are included in this plot and these in turn include all of the variables previously listed. A straight line has been fitted to the data and the coefficient of linear correlation was computed to be —0.96. Further comparisons of this nature have shown the same trend.

From these accumulated data it may be concluded that the Marshall test, while being an empirical test, nevertheless, is one which reflects the fundamental properties of a mixture. Further than this, since the Marshall test has been found to be one which does reflect these properties, the incorporation of the test as a part of some design procedure appears to be reasonable.

Corps of Engineers Design Procedure

In any realistic design procedure, carried out under laboratory conditions, factors other than the stability of the mixture must be considered. These factors should include the method by which the specimen is formed and the density that is obtained. The total void content of the mixture and the percentage of aggregate voids filled with asphalt are known to affect the durability of the mixture in service and some limiting criteria should be set to control these characteristics. Finally, or perhaps primarily, it is necessary to correlate laboratory and field performance to establish the limiting criteria on which the design procedure is based. The U. S. Corps of Engineers has established a design procedure for asphaltic concrete in which the Marshall test is used to measure the stability of the mixture, and durability factors are controlled by limiting the total void content and the percentage of aggregate voids filled with asphalt (4).

Five curves are needed to select the design asphalt content by the Corps of Engineers' design method (see Figures 4, 5, and 6). Marshall specimens are made at several asphalt contents which are selected so as to include the design asphalt content. The unit weight of each specimen is determined and mixture voids and aggregate voids filled are computed on the basis of the apparent specific gravity of the aggregate. The specimens are tested in the Marshall apparatus and values for stability and flow are found. Values for these five properties are plotted versus asphalt content and the design asphalt content is selected as follows:

The asphalt contents at the peak of the unit weight curve, at the peak of the stability curve, at 4% total voids and at 80% voids filled are picked from their respective graphs. The average of these four values is the preliminary estimate of the design asphalt content. This estimate is then checked by reference to the graphs. For surface mixtures designed to carry 100 psi. tire pressure, the mixture must have a stability of 500 lb. or higher, a flow of 20 or less, a total void content of 3% to 5%, and between 75% and 85% voids filled. If the mixture at the estimated design asphalt content meets these requirements, this estimate becomes the final design. If the mixture does not meet one or more of the criteria, some adjustment is necessary (4).

Indiana Surface Grading

During the past year the Corps of Engineers' design procedure has been applied to Indiana A H Type B bituminous concrete surface mixtures. An average aggregate grading within the specified allowable limits was used, Figure 3 shows this aggregate grading compared to the grading limits specified by the Corps of Engineers for a similar mixture (½-in. maximum aggregate size). The Corps of Engineers' grading limits are shown by the dashed lines and the average Indiana grading is shown by the solid line. It is evident that the typical Indiana mixture is not within the range for which correlation has been established by the Corps of Engineers. It is also evident from the curves that the mixtures specified by the Corps of Engineers are more densely graded than Indiana A H Type B mixtures. It is not the purpose here to compare the merits of the two types of mixtures, but only to point out that two types of mixtures are involved. Each type has its merits and shortcomings. It might be mentioned, however, that the Indiana grading, containing less fines, does tend to be less critical with small variations in asphalt content than is the case with the more densely-graded aggregate blends.

Application of Design Using Absorptive Stone

The Corps of Engineers' design method was first applied to the typical Indiana aggregate grading for a case in which an absorptive crushed limestone was used. The way in which stability, flow, and unit weight varied with asphalt content in the case of this aggregate is shown in Figure 4. These curves are typical of many other such curves found for various mixtures and are easily interpreted in applying the design method. In computing voids, however, some difficulty was encountered.

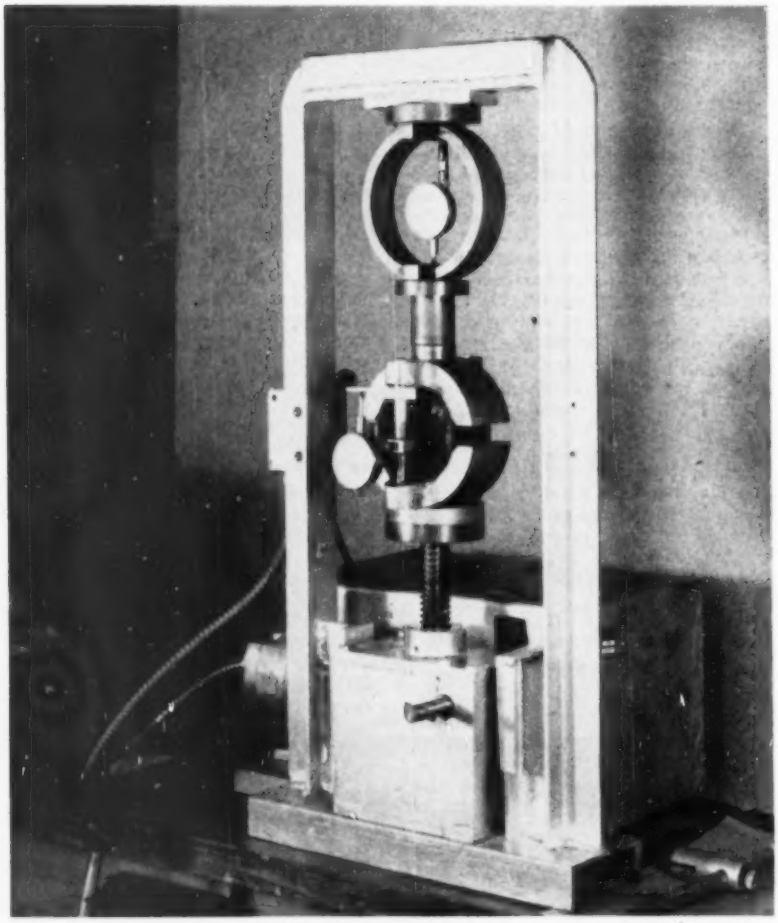
It was mentioned earlier that two of the criteria for design by the Corps of Engineers' method are the limiting values for total void content of the mixture and the percentage of aggregate voids filled with asphalt. Further, it was stated that these values of voids are to be computed using the *apparent* specific gravity of the aggregate. It is recognized that when computing voids on this basis it is assumed that all of the voids that were water-permeable under the conditions of the apparent specific gravity determination are permeable to hot asphalt cement to the same degree. This may or may not be true in all cases. However, all of the correlation work performed by the Corps of Engineers, from which evolved the various design criteria, was based on certain standard procedures, one of which was a voids calculation based on the standard ASTM apparent specific gravity of the aggregate (ASTM Designations C 127-42 and C 128-42). When attempting to apply an empirical design procedure, test methods should be the same as those used in establishing the design procedure. However, in the case under consideration this proved to be not possible.

The variation of total voids and voids filled with asphalt content is shown in Figure 5. The horizontal broken lines indicate the void contents at which, according to the design procedure, the asphalt contents should be picked in making the preliminary estimate of the design asphalt content. These figures are 4% total voids and 80% voids filled. The solid horizontal lines delineate the ranges which are considered satisfactory in the final design (3-5% total voids and 75-85% voids filled). Note the positions of the voids curves, computed from the apparent specific gravity of the aggregate, in relation to these boundaries. These are the curves shown by the dashed lines with the points denoted by crosses. The total voids curve reaches a value of about 5.2% at 7½% asphalt. If the curve were extrapolated, 4% voids would be reached at 8% or 8½% asphalt.

In any case, the minimum design asphalt content necessary to satisfy the total void requirement on this basis is about 7½%. Approximately the same is true of per cent voids filled. It can be seen from the curves on the right that the minimum requirement is not met until the asphalt content is approximately 7¼%. Reference to Figure 4, however, shows that this mixture reaches the maximum allowable flow of 20 at an asphalt content of approximately 6¾%.

It is apparent, then, that no satisfactory asphalt content can be found for this particular aggregate blend which will meet all of the requirements as they have been defined when voids computations are based on apparent specific gravity of the aggregate.

Proceeding on the assumption that, in the case of an absorptive aggregate, voids calculated on the basis of apparent specific gravity may sometimes give an erroneous result, a specific gravity value for the aggregate was determined which attempted to take into account the actual absorption of asphalt into the aggregate pores. This specific gravity value was



★ Figure 1—Marshall test apparatus

termed "effective" specific gravity.

The concept of effective specific gravity may be understood most simply by imagining a standard ASTM apparent specific gravity test being made, but substituting hot asphalt cement for water. In the usual case, the asphalt will not permeate the aggregate pores to as great an extent as will water. This has the effect of *increasing* the volume of aggregate that is impervious to the permeating liquid under the conditions of the test and, hence, of reducing the specific gravity value from that found in the apparent specific gravity determination using water. Effective specific gravity should have some value less than apparent but greater than bulk specific gravity.

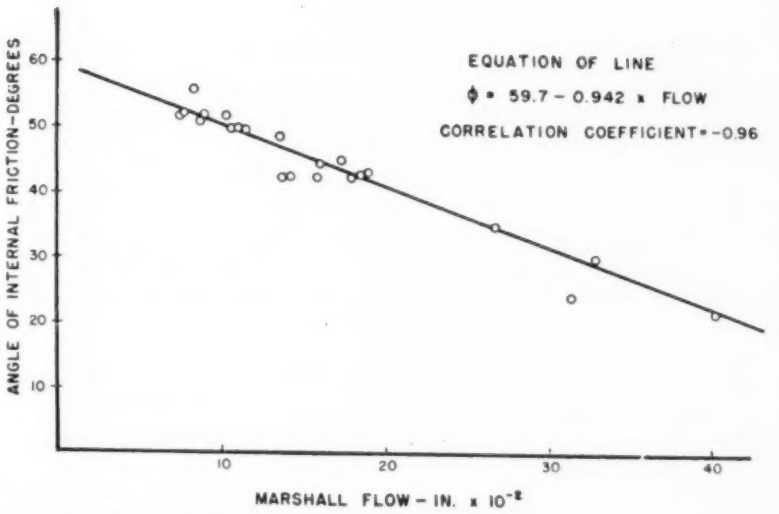
The method used to assure the effective specific gravity of an aggregate may take one of several forms. The hypothetical method outlined in the previous discussion has several practical limitations. A system which utilizes a voidless, compacted specimen of the bituminous-aggregate mixture has been reported (5). For the present work, a standard Marshall specimen was formed at an asphalt content of 6%. The voids in this specimen were saturated with water using a vacuum technique and the actual void content of the specimen was computed. Knowing the actual void content and the composition of the specimen, the effective specific gravity of the aggregate, as it existed in the mixture, could be computed.

The voids computed using the effective specific gravity are shown in Figure 5 by the dotted lines with the points denoted by circles. On this basis a design is possible which will meet the criteria of the Corps of Engineers. It can be seen from the curves computed from effective specific gravity that an asphalt content of as much as 6½% may be used without having a total void content of less than 3% or a percentage of aggregate voids filled of greater than 85%.

In Table I are shown the asphalt contents picked from the peak of the unit weight curve, peak of the stability curve (Figure 4), and from the voids curves (Figure 5), following the standard Corps of Engineers' procedure except that the voids were computed by using effective rather than apparent specific gravity. The average of these asphalt conterts is 5.5%. Checking this asphalt content back against stability, flow, and voids requirements, it is found to be satisfactory and according to the Corps of Engineers' design procedure modified to include effective specific gravity, this asphalt content of 5.5% would be the one selected for use.

Application of Design Using Non-Absorptive Stone

Since the design asphalt content found in the previous application is

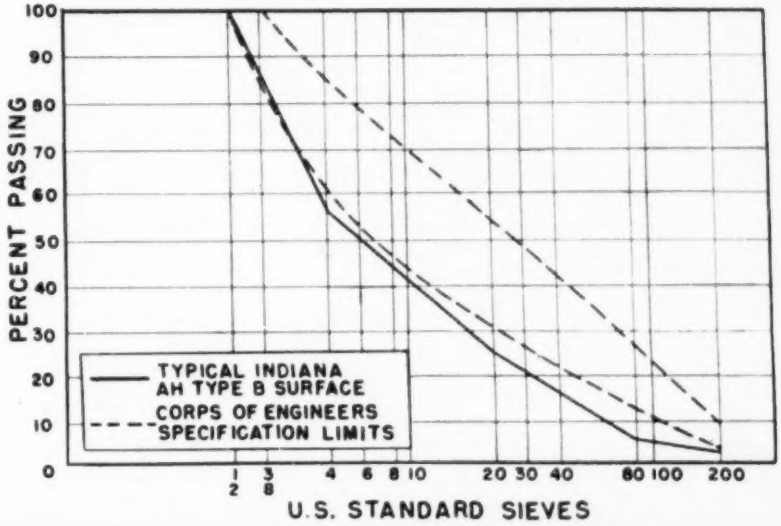

EQUATION OF LINE
ϕ = 59.7 - 0.942 x FLOW
CORRELATION COEFFICIENT=-0.96
ANGLE OF INTERNAL FRICTION-DEGREES
MARSHALL FLOW - IN. x 10^{-2}

★ Figure 2—Correlation of angle of internal friction with Marshall flow

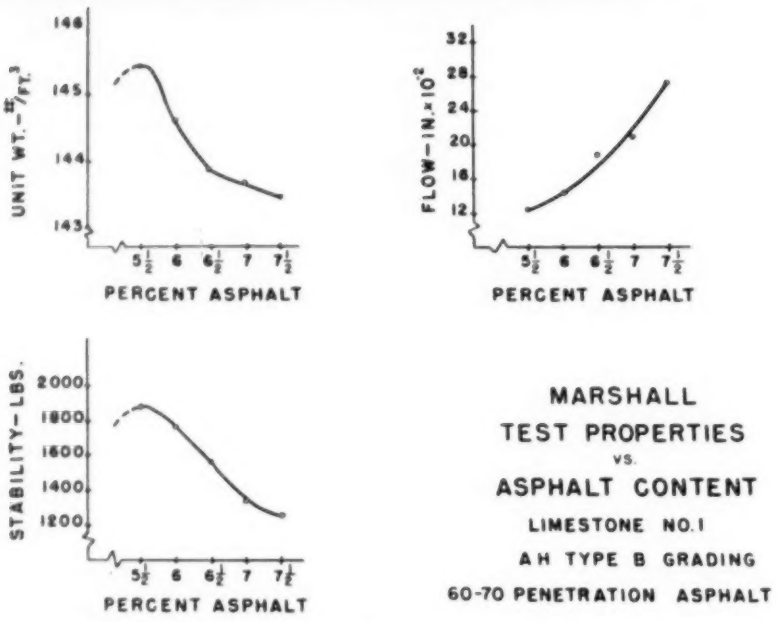
at least one per cent lower than that thought to be satisfactory on the basis of field performance of many comparable mixtures, it remains open to question as to whether the established criteria did not fit the case because of the fundamentally different type of mixture or because an absorptive aggregate was used. Consequently, a second series of similar tests was performed using a more normal, non-absorptive crushed limestone. The design curves for this series are shown in Figure 6. For this case, application of the design criteria for voids based on apparent specific gravity of the aggregate was possible and the test values found and the resulting design asphalt content are shown in Table II.

It can be seen in Table II that the preliminary estimate of 5.6% meets the criteria established by the Corps of Engineers and under their method, 5.6% asphalt would be the design asphalt content for this case.

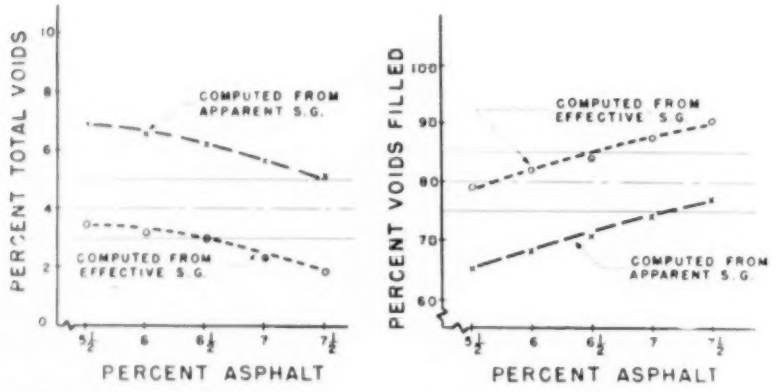
Compare this design asphalt content to that previously noted for the other aggregate. Both are approximately 5½%, a figure which, from experience, is perhaps one per cent too low. From these considerations, the conclusion may be drawn that the design method used by the Corps of Engineers is not applicable to Indiana A H Type B bituminous concrete surface mixtures because of fundamental differences in the types of mixtures involved. However, what of the criteria set up as stability and durability requirements for the mixture, that is, minimum stability of 500 lbs., maximum flow of 20, 3-5% total voids and 75-85% voids filled? Since the research done has shown that the Marshall test reflects the fundamental properties of a mixture that are of interest in design, it may be that the



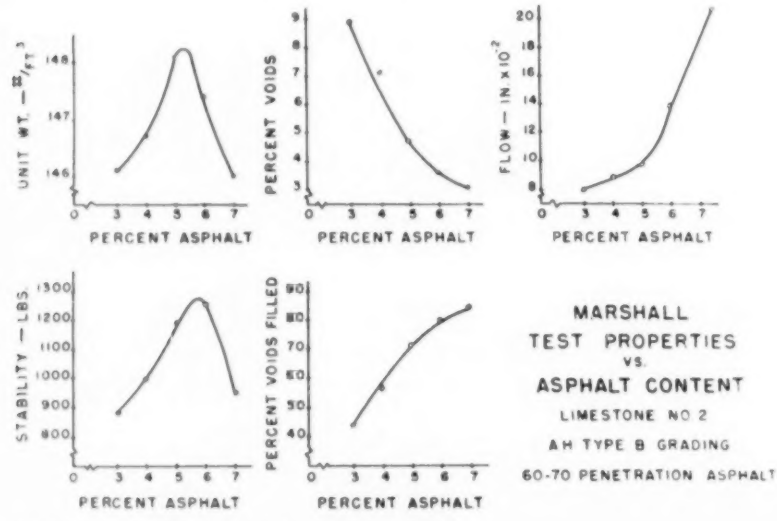
★ Figure 3—Comparison of typical AH type B grading with Corps of Engineers specification limits



★ Figure 4—Marshall test properties vs. asphalt content



★ Figure 5—Voids curves; Marshall tests—Limestone No. 1



★ Figure 6—Marshall test properties vs. asphalt content

case bears further consideration.

The difficulty may lie in one of three directions. It may be that the design *criteria* used by the Corps of Engineers need modification for application to Indiana mixtures. Secondly, there exists the possibility that the specimen produced by the Marshall method of compaction is not representative of the mixture on the road, a condition which must be met to some degree if a laboratory test is to be useful. Lastly, it may be that the *criteria* themselves need little or no revision but that the design *procedure* needs to be changed for application to Indiana conditions. That is, perhaps the change should be made in the way the design asphalt content is chosen from the test data.

The first possibility may be investigated by picking from the respective test curves, the test values at an asphalt content about 1% higher than the design asphalt content. For example, choose 6.5%.

The test values at 6.5% asphalt for Limestone No. 1, the absorptive aggregate, and for Limestone No. 2, the non-absorptive aggregate, are shown in Table III. Also shown are the limits for the various criteria that are specified by the Corps of Engineers. A comparison between the test values at 6.5% asphalt and the specified limits shows that these criteria are met by mixtures made from each aggregate at this asphalt content. The established criteria, then, are met at an asphalt content known to be realistic.

Variable Specimen Compaction

To explore the effect of variable specimen compaction and degradation of the aggregate, specimens were made with Limestone No. 2 using a compactive effort equal to one-half that normally employed in the standard Marshall test. These specimens were tested by the Marshall method and a design asphalt content was computed for this series by the methods previously outlined.

The data pertinent to this selection are shown in Table IV. In general, it may be seen that the lesser compactive effort caused a shift to higher asphalt contents. The design asphalt content is 6.6%, which experience has shown to be satisfactory. However, limited density data that are available indicate that the specimen density produced by this lower compactive effort is not realistic for field conditions and this modification is probably not satisfactory even though a more realistic design asphalt content is obtained. Sufficient data have not yet been accumulated to say whether either compactive effort is realistic with respect to degradation of the aggregate.

Modified Design Procedure

In view of these considerations, suppose that a design procedure is contemplated in which the established

Table I
DETERMINATION OF DESIGN ASPHALT CONTENT

Limestone No. 1

Test Property	Asphalt Content at Selected Point on Design Curve: Point on Curve	% Asphalt	Test Value at Asphalt Content of 5.5%
Unit Weight	Peak	5.5	.....
Stability	Peak	5.5	1890#
Flow	.....	.....	12.0
% Voids	4	5.2	3.6
% Voids Filled	80	5.7	79.0
Design Asphalt Content (Average)		5.5%	

Table II
DETERMINATION OF DESIGN ASPHALT CONTENT

Limestone No. 2

Test Property	Asphalt Content at Selected Point on Design Curve: Point on Curve	% Asphalt	Test Value at Asphalt Content of 5.6%
Unit Weight	Peak	5.4	.....
Stability	Peak	5.6	1300#
Flow	.....	.....	11.8
% Voids	4	5.6	3.8
% Voids Filled	80	6.0	77.0
Design Asphalt Content (Average)		5.6%	

Table III
TEST VALUES AT 6.5% ASPHALT

Limestone Nos. 1 and 2

Test Property	Test Values at 6.5% Asphalt: Limestone No. 1	Limestone No. 2	Criteria to Be Met
Stability	1570#	1140#	500# +
Flow	17.6	16.7	20—
% Voids	3.0	3.3	3-5
% Voids Filled	84.5	82.5	75-85

Table IV
DETERMINATION OF DESIGN ASPHALT CONTENT

Limestone No. 2—Compaction ½ Normal

Test Property	Asphalt Content at Selected Point on Design Curve: Point on Curve	% Asphalt	Test Value at Asphalt Content of 6.6%
Unit Weight	Peak	6.0	.....
Stability	Peak	7.0	1050#
Flow	.....	.....	17.3
% Voids	4	6.5	3.9
% Voids Filed	80	7.0	79.5
Design Asphalt Content (Average)		6.6%	

Table V—DETERMINATION OF DESIGN ASPHALT CONTENT

Limestone No. 2—Modified Design Method

Test Property	Asphalt Content at Selected Point on Design Curve: Point on Curve	% Asphalt	Test Value at Asphalt Content of 6.4%
Stability	1000#	6.9	1160#
Flow	20	6.9	16.0
% Voids	4	5.6	3.4
% Voids Filled	80	6.0	82.0
Design Asphalt Content (Average)		6.4%	

criteria are kept relatively unchanged and in which the standard compactive effort is used. It may be recalled that two of the points chosen for design by the Corps of Engineers' method are the peak of the unit weight curve and the peak of the stability curve. It has been found that these factors carry a weight in the design which may cause the selection of too low an asphalt content for Indiana mixtures. It is suggested that perhaps the design asphalt content might be selected not by recourse to maximum stability and density but by choosing the asphalt contents which produce some minimum allowable stability and maximum allowable flow. This concept, together with voids requirements, may constitute a more satisfactory procedure for A H Type B mixtures.

To illustrate, Table V has been prepared in which a design asphalt content has been calculated for Limestone No. 2 using these concepts. The asphalt contents giving a flow of 20, a stability of 1,000 lbs. (taken at the high asphalt side of peak stability), 4% total voids, and 80% voids filled have been averaged to give a preliminary estimate of the design asphalt content. These four values, as shown in Table V, have an average of 6.4%.

The test values at 6.4% asphalt, shown in the right-hand column of Table V, satisfy the criteria before mentioned.

TABLE VI
CORPS OF ENGINEERS AND A. H. TYPE B GRADINGS

(Appendex)

Sieve Size	% Passing Corps of Engineers' Grading Limits*	A H Type B Grading
½"	- 100	100
⅜"	84 - 100	89
#4	60 - 85	52
#10	43 - 70	41
#40	23 - 42	17
#80	13 - 26	4
#200	4 - 9	3

*Information from reference 4

Table VII—MARSHALL TEST DATA

LIMESTONE NO. 1

% Asphalt	Unit Wt. Mixture #/ft.³	Marshall Stability #	Marshall Flow 1/100 in.	% Total Voids: Apparent Sp. Gr.	% Total Voids: Effective Sp. Gr.	% Voids Filled: Apparent Sp. Gr.	% Voids Filled: Effective Sp. Gr.
5½	145.4	1890	12.3	6.8	3.4	65.3	78.9
6	144.6	1775	14.6	6.5	3.1	68.3	81.9
6½	143.9	1570	18.7	6.2	2.9	70.9	83.8
7	143.7	1355	21.0	5.6	2.3	74.2	87.5
7½	143.5	1270	27.3	5.1	1.8	77.2	90.5

LIMESTONE NO. 2—STANDARD MARSHALL

% Asphalt	Unit Wt. Mixture #/ft.³	Marshall Stability #	Marshall Flow 1/100 in.	% Total Voids	% Voids Filled
3	146.1	880	8.0	8.9	44.0
4	146.7	1000	8.8	7.1	57.0
5	148.1	1195	9.7	4.7	71.5
6	147.4	1255	13.8	3.6	80.0
7	146.0	945	20.7	3.1	84.0

LIMESTONE NO. 2—COMPACTION ½ STANDARD

% Asphalt	Unit Wt. Mixture #/ft.³	Marshall Stability #	Marshall Flow 1/100 in.	% Total Voids	% Voids Filled
4	146.6	665	8.0	7.1	57.0
5	146.8	800	10.5	5.5	68.2
6	146.7	930	13.7	4.1	77.5
7	144.8	1060	20.0	3.9	80.6

Does the wire rope you use earn this kind of TRUST?

Typical of many, one master mechanic says, "We *always* use Hercules Red-Strand wire rope, because we know we can trust it for long life and safe service . . . every time." An inspector reports, "On a work test, we really abused Leschen rope. It *more* than satisfied our requirements."

HERCULES Red-Strand deserves it

Why is that so? Simply because *higher-than-rated quality* in Red-Strand wire rope means *greater-than-expected* safety and performance.

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The Watson-Stillman Company
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In Summary

In this presentation no attempt has been made to give a specific design procedure for Indiana A H Type B bituminous concrete mixtures. An attempt has been made only to show evidence to the fact that if the necessary correlating data are obtained, it is likely that a satisfactory design procedure may be established having the Marshall test as its basis. Further, it is shown to be possible that the Corps of Engineers' design procedure, including the specific gravity value used for voids calculations, would need modification for the particular conditions under consideration.

Even though the Marshall test is empirical, there are points of simplicity and possibilities of correlation with performance that favor this test as a basis for a design method. It would be a fallacy, however, simply to assume that a specific design method based on the Marshall or any other empirical design test would be applicable to conditions other than those for which correlation had been established.

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5. "Hot-Mix Asphalt Design Studies," by J. R. Martin and A. H. Layman, Publication No. 75, Oklahoma Engineering Experiment Station, Oklahoma A and M College, Vol. 17, No. 3, March, 1950.

The Massey-Harris and Harry Ferguson Companies issued today the following joint statement announcing their amalgamation: "It has been jointly announced by James S. Duncan, CMG, President of the Massey-Harris Company Limited on behalf of its Board of Directors, and by Harry Ferguson, Chairman of the Harry Ferguson Companies, that the two world-wide organizations which they represent have agreed to amalgamate and to operate in the future under the name of Massey-Harris-Ferguson Limited.

Robert L. Westbee was elected a vice president of Minnesota Mining & Manufacturing Co. in August. He will head 3M's newly-created electrical products division, which includes the electrical insulation and sound recording tape division, the Irvington Varnish & Insulator division, and the American Lava Corp.

Engineers surveyed for opinions on rubber in bituminous road mixes

The Natural Rubber Bureau, Washington, D. C., has conducted an independent survey of highway and municipal officials and engineers to find what they think of the use of rubber material in road construction. The concensus of replies indicates a belief that "rubber roads are here to stay," according to the Bureau.

Almost 100% of the officials replying know about the use of rubber in roads. One-third of them believe that the addition of rubber to asphalt is going to become a standard method.

"The most significant finding in this survey," notes Harry K. Fisher, Road Consultant to the Natural Rubber Bureau, "is that nearly half the engineers could find no disadvantage at all with rubber roads. The only reservation of almost the entire remainder of names replying was additional cost. Rubber does add somewhat to the cost of laying a road, and the total eventual road cost weighed against proved safety and other service advantages will of course need to be known as data become available.

"Every day, however," states Mr. Fisher, "we are coming closer to the day when results should prove that the small amount of rubber powder introduced into the mix—from 1½ to 5%—also adds longevity and less-repair factors that will more than make up for the added original cost. Once these cost-saving improvements are borne out, you can look to rubber-in-asphalt as a standard for highway construction before the next decade is over."

At the Natural Rubber Bureau Laboratory and in on-the-job tests in various states, highway engineers and chemists are compiling information as to the exact advantages obtained by adding rubber powder to asphalt mix. Up to now, this information is bearing out the road's ability to bleed less in summer, crack less in winter and better withstand traffic shock.

In the survey just completed, highway engineers indicated generally that three to five years of testing would give "a fair idea of the life expectancy of new surfacing materials." This country's oldest stretch of road incorporating natural rubber powder has now been down for about four years. If the engineers' test-time estimates are accurate, it shouldn't be too long before there are forthcoming some definite answers on the ability of such surfaces to cut costs by adding longer life and lessening repair and maintenance.

Copy of the complete survey detailing in full what American highway officials think of rubber roads, is available on request. Write to the Natural Rubber Bureau, 1631 K Street, N. W., Washington 6, D. C.

ROSCO'S P.M.*

makes the difference

*P. M. = Pressure Metering

Applying bitumen through 2 feet of spraybar as shown may not appear unusual or different, but when the operator can use any length—from 1 to 24 feet—*without changing the pressure* and *without any application adjustment whatever* . . . then there's a difference. It's *Rosco's Pressure Metering Method* that makes that difference.

The P. M. method of applying bitumen is *not* metered by the bituminous pump, nor is the amount of discharge measured in relation to the pump revolutions. Normal wear of the pump and occasional, unavoidable nozzle clogging never affect the application rate. Here again, Pressure Metering *makes the difference* . . . the rate is automatically maintained by Rosco's P. M. system.

It is this Pressure Metering Master Valve, the "heart" of Rosco Distributors, that gives you this built-in control of pressure which is the only accurate method of obtaining precise bituminous application. This is the valve that also directs the flow of material for all of the Rosco Distributor functions.

Make the difference pay off. Let your Rosco dealer show you how. Write the factory for descriptive bulletins with specifications of Distributors with P. M.

•

ROSCO MANUFACTURING CO.

3118 Snelling Ave. • Minneapolis 6, Minn.

Small Community Gets a

Re-usable gravel was stored in vacant lots . . .

. . . or along side streets, mounded for traffic

Curbs were properly cured for durability

Rockford Blacktop Construction Co. completed contract for this small city, whose ambitious paving program has eliminated mud and dust and transformed the city's appearance.

THE village of Mount Morris, Illinois, in northwestern Illinois, is today a "picture window" town. Most of its 2,700 people live in well painted homes with attractive lawns, as you would expect to find in a prosperous farming area and in a town with a large printing plant maintaining a high employment.

The only thing lacking heretofore was to make the transition from old-style unimproved streets, with their ragged, weed grown ditches, to city-type streets. Much of the town plat today is so paved, with neat curbs alongside the bituminous pavement. At relatively low cost, property owners have swapped old oiled mat gravel or earth for new streets, complete with necessary storm sewers. Assessment bonds aided by funds from general taxes financed the program.

The paving work was done in 1951 and 1952, following several years of agitation by propery owners. A contract was awarded to Rockford Blacktop Construction Co., of nearby Rockford, Illinois, in May of 1951 for about $214,000 for improving some 40 blocks. Of this amount, $98,000 was provided through assessments benefiting property. A general bond issue of $150,000 was voted by the village board to cover the remainder of the construction cost and provide for engineering and for contingencies. The plan was to issue up to $100,000 in assessment bonds to be retired by property owners. The remainder is to be retired by village proceeds from state motor fuel tax refunds.

Except for a business street, which was paved with 6-inch uniform thickness concrete on a granular blanket, the typical street design consisted of 2 inches of asphaltic hot mix on a 7-inch crushed gravel base. Concrete curb and gutter was usually placed 37 ft. back to back. This width was considered desirable for residence streets to permit parking on both sides and still allow two-way traffic.

The contractor opened a few blocks at a time as assessment petitions came in, completing storm drains, grading, curb and gutter and the rolled stone base for a substantial part of the program by November shutdown time.

40-Block "Face Lifting"

Standard methods were used, hauling scrapers aiding motor graders in removing and storing the existing road material and performing the relatively shallow grading and cross-sectioning.

Then in 1952 the remaining preliminary work was done and all surfacing placed from an asphalt plant located in a nearby city.

An interesting phase of the preliminary work was the stockpiling of re-usable roadway materials. Material not to be reused was spread in low spots in adjacent lots, as desired by lot owners. Material for re-use was stockpiled either on vacant property or in some cases along side streets. When on side streets, the stockpiles were built in long low mounds with flat cross-sections so that traffic could continue to use the streets. See accompanying pictures for examples of such stockpiling, which was part of a policy of minimizing inconvenience to town citizens during the progress of the contract.

Mayor Ralph H. Zickuhr reports that property owners are well pleased with their new streets. Front-foot cost, including drainage, has averaged $10 total of which $4 was paid by property owners and $6 by Village. C. K. Willett served as engineer.

According to A. J. Armour, engineer for the contractors, particular credit for this street improvement program goes to the city officials of Mount Morris for their fortitude and determination in fostering such a major program. In order to develop such a program it was necessary to find a way to finance it.

Mayor Zickuhr and City Attorney Paul Rees found a way. By combining Special Assessment Bonds with General Obligation Bonds, it was possible to get purchasers of the bonds without any appreciable discounts. Such a method could be used by other communities in the State for similar undertakings.

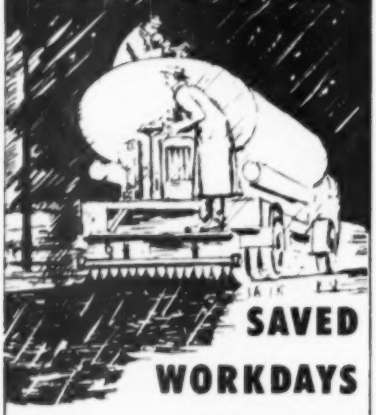
• Three parking meter users in each 100 in New York City, by accident or design, overstay the legal limit, according to a survey. New York City started putting in meters in 1951, now having 13,000 in use or being installed in 65 shopping districts. Another 5,000 to 10,000 meters are contemplated, according to a newspaper report which states that returns have averaged $160 to $217 per meter per year, with $60 per meter for installation cost.

Pans did most of the grading and shaping . . .

. . . assisted by a motor grader and a loader

The new streets have spruced up the whole town

1. STRENGTHENS THE BOND
2. PROTECTS AGAINST WATER



SAVED WORKDAYS on N. J. TURNPIKE

During construction of the N. J. Turnpike, penetration courses were shot with **NOSTRIP**-treated asphalt under moisture conditions which normally would have halted the job.

NOSTRIP *offers important advantages*

in all road applications of asphalt — surface treatment, mixed-in-place (mulch), penetration macadam, etc.

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is explained in a comprehensive new brochure covering the use of NOSTRIP in all types of bituminous paving. *Send for your FREE copy today.*

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Drop post card into outgoing mail. No stamp is required.

New Truck Crane Has High Mobility

A new highly mobile truck-crane, designated as the Pitman Crane Model 80 has been introduced by the Pitman Manufacturing Co., Dept RS, 300 West 79th Terrace, Kansas City, Mo. Capacity up to four tons on a 25-foot boom, with additional boom lengths up to 59 feet are features of the new crane, which is designed for installation on trucks 2½ tons or larger. Precision operation, ability to use the truck it is mounted on for more than a single purpose, quick set-up time, ease of control; are claimed for the Pitman crane. Key to the precision operation of the crane is versatile loadline winch which can be operated either power-up and power-down or free-spooling. This allows the operator either to let the load down under full power or to slip it down as fast as he wants with a foot brake. Precise boom action is afforded by (1) a power-up and power-down topping winch, which raises and lowers the boom, and (2) a double-acting hydraulic cylinder which swings the boom in a 180-degree arc. Maximum capacity loads can be topped with the boom. One of the most outstanding features of the crane is that a fifth wheel can be installed on the crane's sub-frame on a long wheelbase truck, allowing the owner to use the same truck on which the crane is mounted to haul a trailer.

Pitman Crane Model 80

Grader Attachment Speeds Slope Cutting

A new motor grader attachment claimed to have unusual advantages as a time-and-labor saver has been introduced by the Hasselbalch Fintzell Co., 215 North 12th St., Omaha, Neb. Engineered to eliminate expensive road re-shaping by hand, the Grade-More slope grader is stated to cut perfect for slopes and shoulder lines (in one operation) while the motor grader stays on top of the road. The 16-foot mold board is suspended from the side of the motor grader and down the slope to cut the road slope to any desired degree. It also adds yardage to dirt quantities by

Grade-More Slope Grader

moving material from ditches to the top of the roadway. The mold board is controlled from the operator's seat through mechanical linkage with the regular motor grader controls.

Heavy Duty Trench Hoe Boom

An optional heavy duty trench hoe boom for the Gar Wood 75 Series excavators has been announced by Gar Wood Industries,

Excavator with Heavy Duty Trench Hoe Broom

Inc., Findlay division, Findlay, O. Designed for extra rugged excavation, cross country pipe line work and other extreme operations, the new boom weight 8,500 lb. As is the standard trench hoe boom, it is easily removed for conversion to shovel, crane, drag line, clam shell, pile driver and the exclusive foundation borer attachments on the 75A, the heavy duty 75B and the 75BT truck crane.

Improved Moldboard Glaze

Norgahn Company, Snow Plow Specialties, Wausau, Wisc., announces a new glaze for preventing adherence of snow to moldboards and protecting them from rust during idle periods. It differs from the earlier, well-known product in giving more coverage per gallon, lasting longer in service, and giving a better performance. Coverage of the new glaze is stated to be approximately 600 sq. ft. per gallon. It does not freeze at 65 deg. below zero.

Rotary Snow Loading Attachment

Another attachment for Caterpillar motorgraders, this one recently announced, is the Rivinius snow loader. It is a rotary type snow blower affair that attaches to the moldboard of a Caterpillar 12 or 112 motorgrader. The deflection chute is high

Rivinius Snow Loader at Work

enough to reach over the bed of dump truck bodies. The Rivinius hydraulically-driven snow loader eliminates power-loss and frozen mechanisms, and is manufactured by Rivinius, Inc., Eureka, Ill.

Tractor Mounted Rock Drill

Complete mobility, speed, small crew and low maintenance are some of the advantages claimed for the new EECO rock drill, announced by Eugene Engineering Co., 1185 W. First St., Eugene, Ore. The drill has the new and exclusive EECO flotation method which is claimed to prevent stuck steel and lost holes. The rig has a flexible boom designed to drill any selected direction or angle. It is easy to position—up, down, around. The drill is

EECO Rock Drill

operated from a movable control panel allowing operator to stay away from face. The specifications include the following items: Compressor: Standard Make—400 C.F.M. Drill: Standard make—4-in. Winches: Two 10-ton Worm Drive powered by 7½ h.p. Air Motor. Boom: 23 ft. Drill Feed: 20 ft. 6 in. Mast: 15 ft. 9 in. Cable: ½ in. Wire Rope. Power Take-Off: 2-7/16 in. shaft, spline-coupled. Two double-taper roller bearings. Total Weight: 46,000 lbs. (approx.).

Five New Attachments for Front End Loader

Five new attachments to increase the job flexibility of Scoopmobile Model LD10 and LD5 front-end loaders have been announced by Mixermobile Manufacturers, 8027 N. E. Killingsworth, Portland 20, Ore. Included on the list are backfill blade, crane boom, concrete hopper, dozer blade

Concrete Hopper Attachment for Scoopmobile Front End Loaders

GarWood 75

A New 3/4 yd. Trench Hoe to Dig Deep in Close Quarters!

The rugged new Gar Wood trench hoe digs to a 17'10" depth, dumps at any height up to 19'3" and cuts to 40", 36", 31" and 26" widths with optional dippers . . . Both the standard-duty 75A and the heavy-duty 75B available to suit your own working conditions! . . . All Gar Wood trench hoes are of gooseneck construction . . . Exclusive right angle drive—power actuated mechanical drum clutches —conical hook rollers and many other operating advantages for faster, easier work . . . Optional fluid coupling absorbs shock loads . . . Easy field conversion for all crane, shovel and clam operations including the new, exclusive, Gar Wood Foundation Borer — the machine that bores and bells in one operation . . . See your dealer for details —

FOR LIFTING UP TO 40,000 LBS.

Use Gar Wood's heavy-duty, model 75BT, truck crane! . . . Optional power load lowering and all the other Gar Wood features. Specially designed chassis for speed and mobility.

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GAR WOOD INDUSTRIES, INC.

Findlay Division • Executive Offices • Wayne, Michigan

F-531

Look at the uniform triple-lap coverage and straight edges you get with a "Black-Topper"

You can see the results of Etnyre's exclusive triple-lap coverage (spray from each nozzle overlapping *two* other sprays) in the unretouched photograph above. Road builders have learned that single lap coverage is utterly unsatisfactory . . . double lap coverage somewhat better . . . but triple lap coverage is the complete answer to hitting rough aggregate from all possible angles for complete coverage.

Moreover, by turning the end nozzle as indicated, you get a sharp line edge which adds the finishing touch to the job. With this accurate alignment, you can spray right up to the edge of curbs. Such dependable operation and uniform, accurate distribution are typical results you can expect from an Etnyre. Investigate today —find out how soon a "Black Topper" can be delivered to you to handle your work faster, better, more economically!

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"Black-Topper"

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and lift forks. These low-cost attachments are designed to utilize the heavy-duty power of the four-wheel drive, four-wheel power steer loaders for many specialized tasks in construction. The lift forks, backfill blade and concrete hopper mount directly on the hydraulic boom, replacing the scoop and using standard fittings for fast change-over. The dozer blade, for the LD10 only, attaches directly to the chassis, which takes up the strain of heavy dozing. Bucket remains on the boom.

Automatic Drilling Machine

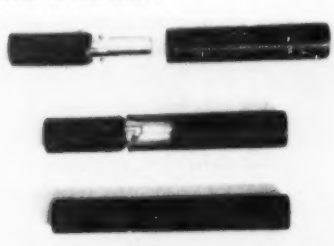
A new Thor No. 380 Automatic Drilling Machine, featuring an integral air-leg feed and automatic air-water back-head, has been announced by the manufacturer, Thor Power Tool Co., Aurora, Illinois. This one-man operated machine is equipped with a specially designed 45-lb. sinker rock drill and a 2¼-in. diameter feed leg, available in either 36-in. or 48-in. length, to make it adaptable for all types of drilling at all angles. The drill can be removed from the leg and used as a sinker simply by loosening one nut.

Thor No. 380 Automatic Drill

Other features include: exclusive six-position throttle control—from complete shut-off to full air and water in logical steps; a single air hose to supply air to drill and leg; hinge joint between drill and leg with tension adjustment; convenient, safe location of controls on back-head; aluminum cylinder and piston; total weight only 80 lbs. Details and specifications in Bulletin JE 1640.

Welding Cable Connector for Heavy Duty

A detachable welding cable connector, announced by Dalweld Co., 1 Bertol Ave., Mount Vernon, N. Y., is designed to eliminate accidental disconnection and constructed for rough usage. Connectors have an expander-type male end which makes a large area contact. When this is inserted into the female end with a quarter turn it makes a wipe-joint fit for complete electrical contact, which assures maximum conductivity. Current-carrying parts are made from bar brass, machined to close tolerances. Casing is a heavy duty insulating fibre tube. The connectors are made for both solder and mechanical connections, in 400- and 600-ampere capacities, and are shipped complete, ready to be attached to the cable.



Dalweld Welding Cable Connector

Collapsible Barricade Sign for Road Construction

A new heavy duty sign for road construction and allied uses has been announced by Standard Signs, Inc., 3190 E. 65th St., Cleveland 27, O. A large "Road Closed" sign which swings freely in a rigid angle iron frame is topped by two or more red flags. The frame also supports a "Detour" sign and a directional arrow sign so that complete directions are given by this one stand. The frame folds so that the entire stand is collapsible and can easily be moved from one job to another. The swinging sign which is interchangeable with signs with other wordings measures 24 in. by 24 in. The entire stand measures 49 in. to top of the flags and 65 in. wide overall. Signs and frame are finished in synthetic porcelain enamel. The entire stand weighs 23 lb.

Collapsible Barricade Sign

Motor for Quick Starting Heavy Duty Engines

A new and entirely different type of hydraulic cranking motor, announced by Hydramotive, Inc., 2323 E. 6th St., Dept. H-15, Cleveland 4, O., is designed for quick starting of heavy duty engines, eliminating the use of storage batteries and electric or pneumatic starters for cranking these engines. Advantages claimed for the new Hydrotor cranking motor are:

Efficient, independent cranking at all temperatures in all climates. Tested successfully at minus 65° F. to plus 150° F.

Higher cranking speeds with less bulk weight results from higher torque characteristic of hydraulic motor constructed from aluminum permanent mold casting.

Two cranking systems in one, since Hydrotor used in combination with recharging pump provides automatic cranking with hand pump available for emergencies.

Protection while operating in hazardous areas. The Hydrotor being non-electric and of aluminum construction is completely explosion proof.

Hydrotor, and Reservoir on Oliver OC-G Tractor

A practical replacement for ordinary cranking systems. It is smaller and lighter, yet more powerful than electric or pneumatic starters.

Adjustable cranking speed since Hydrotor will operate over a range of speeds and slow enough to adjust timing or free engine to maximum rating.

Time Means MONEY To You...

save both by serving your men plenty of cool, refreshing water on the job

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- **HELPS REDUCE ACCIDENTS** due to heat and fatigue.
- **AIDS EFFICIENCY . . .** the men work refreshed.
- **CHECKS CONTAGION, ABSENTEEISM.** It's individual service.

Dixie Safety Slogans will help your men become more safety conscious.

Insulated Dixie Water Carrier

Keeps water cool for hours

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DIXIE CUP COMPANY

Easton, Pa.

True-Lay Paving Machine

A paving machine introduced to the western market this summer by Doug-Lynn Co., Inc., 2257 North Main St., Walnut Creek, Calif., is claimed to turn out a finished job of up to 40,000 sq. ft. in 8 hours, with a three man crew of 1 asphalt raker, 1 shoveler and 1 screed operator. The machine is built to lay asphaltic concrete, crusher run, cement treated and stabilized base in thicknesses of 1 in. to 6 in. Compactness is stated to equal up to 80% of mechanical tamper equipped machines. The standard 8 ft. Model 8 has a width of 9.5 ft., a length of 5.5 fet. and a capacity of 2 tons. The front wheels

True-Lay Paver

are 4 in. by 16 in. cast steel with roller bearings and solid rims. The balance wheels are 6 in. by 16 in. with smooth tread, pneumatic tires. The paver is built of welded steel.

Front End Loader with Torque Converter

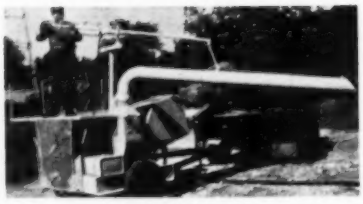
Extra yardage, higher daily output, faster cycles, less breakage, and smoother operation are reported by users of Pettibone's new Model 15, 1½ cu. yd. Speedall front end loader with torque convertor recently made available for national distribution by Pettibone Mulliken Corp., 4700 West Division St., Chicago 51, Ill., accord-

Speedall Front End Loader

ing to Paul E. Lunquist, Pettibone's Construction Equipment Division Sales Manager. Speedall equipped with torque convertor is stated to provide inch by inch control of foot accelerator without shifting speeds or slipping clutch. This makes it simple for operators with minimum experience to produce extra yardage over conventional gear shift loader operations. Among the advantages claimed for Speedall with torque convertor offers are: Extra power for tough going and smoother, faster acceleration throughout the entire loading cycle regardless of the load size.

Mulch Spreader for Newly Seeded Areas

A new mulch spreader, introduced by The Finn Equipment Co., 2525 Duck Creek Road, Cincinnati 8, O., is designed to provide an economical way of spreading mulch of hay, straw, wood shavings and other materials to protect newly seeded areas. The spreader is a highly portable unit, towed behind a truck carrying the mulching material. A high velocity air blast carries the material up to 50 feet

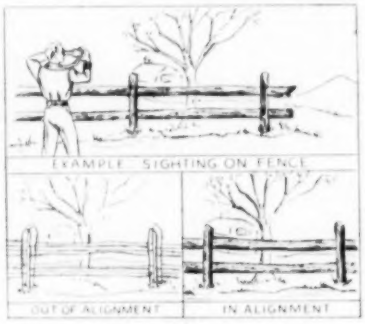


Finn Mulch Spreader

from the machine. This permits the material to fall in an even coating for maximum seed protection. The spreader is also equipped with a pumping unit which makes it possible to spread liquids with or without mulch. This permits the use of adhesives with the mulch for covering steep slopes and embankments which provides protection for the seed bed at a low cost. The machine can be quickly converted into a mist blower for spreading chemicals in insect control and weed killing. It comes equipped with power unit, electric starter, blower, beater, feed chute, discharge spout and tow hitch. The spray and misting attachments are optional.

Field Rangefinder Developed

A portable precision range-finder with a 6-in. base length for measuring distance from 8 ft. to 100 ft. is announced by the Meyer-Opticraft, Inc., 39 West 60th



Example of Use of Rangefinder

St., New York 23, N. Y. The overall accuracy is claimed to be 2%. It is especially useful in measuring distances to inaccessible objects. The operation is simple and ability improves with usage.

New Drill Combines 3 Types of Drilling

With the introduction of the new model B-52 versatile drill, Mobile Drilling, Inc., 960 North Pennsylvania St., Indianapolis,

Model B-52 Drill

Ind., manufacturer of light vehicle, auger-type drills, enters into the deep rotary field. The new model features 500 foot drilling depth, one man operation, skid or trailer mounting with independent power plant or P. T. O. operation. It is designed to fit Ford, International, Willys, Chevrolet or Dodge heavy duty trucks. The B-52 features a dual hydraulic cylinder claimed to assure fast, positive feed with 5, 6 or 7 ft. stroke and 12,000 lbs. pressure. It combines in one unit three types of drilling: (1) auger, (2) rotary core, and (3) percussion.

New Duplex Crushing and Screening Plant

A new duplex crushing and screening plant has been added to the line of portable plants of Pioneer Engineering Works, Inc., 1515 Central Ave., Minneapolis 13, Minn., subsidiary of Poor and Co., Chicago.

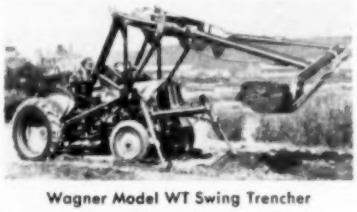
The new plant, Pioneer's Model 35-S, is a lightweight, in-line plant, primarily designed for use in gravel pits. The plant

Model 35-S Crushing and Screening Plant

is equipped with the largest units possible, still complying with weight limitations. In fact, it was designed especially for those areas where weight restrictions are severe and where frequent and rapid moves are necessary, as it can be pulled in and out of a pit without dismantling or removal of conveyors or other accessories. The 35-S plant consists of a 1036 jaw crusher, a 3024 double roll crusher, 2½ deck vibrator screen and the necessary conveyors. Included on the plant is a 30G (30 in.) mechanical feeder, or a 30-in.x10-ft. super heavy service swivel feed conveyor to conveyor on plant, with 30G feeder at lower end. The 16-in.x6-ft. channel frame sand reject conveyor is optional.

New Trenching Machine in Low Price Field

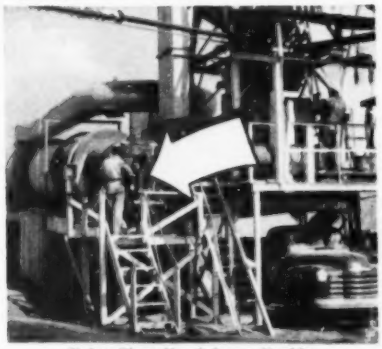
A new trenching machine is now being manufactured by the Wagner Iron Works, Milwaukee, Wis. Designated the Wagner model WT Swing Trencher, the new completely hydraulic unit was under development for three years. It is mounted on the front end of a tractor and is so constructed that the unit can be converted to a heavy duty loader by the addition of a standard loader dipperstick assembly. The highly maneuverable boom of the trencher has a lateral swing of more than 30 degrees to the right or the left of the trench



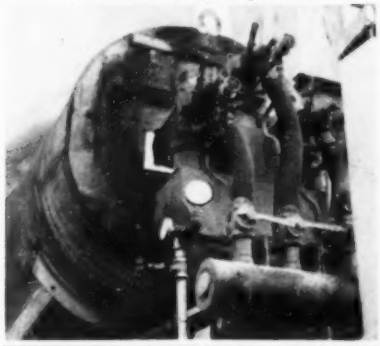
Wagner Model WT Swing Trencher

it is digging and a maximum dump height sufficient to load trucks. It is powered by the independent Wagner hydraulic system and is designed to handle a wide range of bucket sizes and types adding to the unit's versatility.

At Sam Finley, Inc., Atlanta, Georgia



Finley Plant No. 1 has a Hopkins Combination Oil-Gas Dryer Unit



"We have 10 Plants using

HOPKINS VOLCANIC DRYER UNITS"

● Looking for a low-cost burning system for your asphalt plant? Let Sam Finley, Inc. tell you about their experience with Hopkins equipment: "We have ten plants using Hopkins equipment, and in every case, the units have proven very satisfactory to us. We find they have increased production and lowered fuel consumption. Our first Hopkins unit was installed several years ago, and we have been installing them as fast as possible since that time. All of the Hopkins Volcanic units have given us excellent service."

Why don't *you* take advantage of Hopkins' efficient operation, as has the above contractor? A letter or phone call will bring you descriptive literature, complete details, and follow-up by a Hopkins representative.

HOPKINS VOLCANIC SPECIALTIES, INC.
ALLIANCE, OHIO

This Year More People, More Goods Than Ever Before Will Travel over Highways Built with

CUMMER ASPHALT PLANTS

Cummer Offers You the Immense Advantage of More Than Half a Century's Experience in Superior Asphalt Plant Construction

The building of new highways, roads and streets and the improvement of existing thoroughfares are everywhere being pushed forward with the help of Cummer Asphalt Plants. Contractors know that they can depend on Cummer Plants—whether portable, semi-portable or stationary—for fast, profitable production.

The busy Cummer Asphalt Plant pictured at the right is the property of Mooney Bros. Supply Co., New Castle, Penna. This portable model is a complete plant with a capacity of 55 to 60 tons per hour (based on 5% initial water content, dried to within ½ of 1% and heated to 350°-400°F.) and is equipped with dust elevator, washer and enclosed hot and cold elevators.

Designed for efficiency and of exceptionally rugged construction, Cummer Asphalt Plants, manufactured continuously since 1895, have always proved to be consistent money-makers for the contractors who operate them.

Cummer Asphalt Plants Lead the Field with These Outstanding Features—

Mixing towers with vibrating screens and mixer.
Dust collector discharging reclaimed dust into hot elevator.
Two furnace combustion with low pressure burner equipment.
Cold storage bin and feeder.
Enclosed hot and cold elevators.
Diesel or electric power.

CUMMER PLANTS—complete with all motor and starter switches—are available in sizes from 55 to 125 tons per hour. Write for illustrated Cummer Catalog today.

THE F. D. CUMMER & SON COMPANY
1827 East 18th Street — Pioneer Builders of Fine Asphalt Plants — Cleveland 14, Ohio

Here the Jackson is compacting a 12-inch rock course

MACADAM: the JACKSON — in one pass — will sufficiently compact 12 inches of rock to support smooth rollers. In four passes, the JACKSON keys and compacts to final density. It takes just two passes for the Jackson to completely fill voids from top to bottom of the course, when enough dry fines are spread on top in one application.

IN GRAVEL SUB-BASES (BLANKET COURSE) 7 inches thick, at optimum moisture, the JACKSON in one pass obtains densities exceeding 100% of Standard Proctor.

Only with the JACKSON can the operator vary the frequency of vibrations as type of material and speed of travel may require.

for MACADAM Construction!

The Jackson Electric VIBRATORY COMPACTOR

QUICKLY COMPACTS and FILLS ROCK COURSES OF REQUIRED THICKNESS!

The JACKSON Electric VIBRATORY MULTIPLE COMPACTOR consists essentially of the proper assembly and suspension of individual Jackson Vibratory Compactors mounted on a ruggedly designed carriage-tractor having correct working speeds from 0 to 60 ft. per minute, plus a fast reverse travel speed up to 5½ miles per hour.

MANEUVERABLE — The special tractor is mounted on 6 low-pressure pneumatic tires. Permits short turning radius without displacing rock or fines. Moves to various locations on job under own power.

The Jackson Vibratory Electric Multiple Compactor "choking" in screenings in 8 inches of compacted rock course

SPEED — Working speeds up to 60 feet per minute are possible in "choking" or vibrating in the fines because of high frequency of heavy duty vibratory motors.

FLEXIBILITY — The JACKSON is available in a standard width of 13 feet, 3 inches. Units may be subtracted on job to meet conditions requiring narrower widths. For areas inaccessible to Multiple Compactor, one 26" unit can be detached and fitted with operating handle (supplied with equipment) giving contractor a single, self-propelled Jackson manually operated compactor which has received world-wide acclaim for granular soil compaction and bituminous patching.

MULTI-PURPOSE — The entire compactor workhead may be removed, leaving a mobile, powerful Jackson gas-electric power plant of 7½ KVA, producing 110 volts — 130 volts in both 3-phase and single phase A.C., for job or emergency lighting and for running all sorts of electric tools.

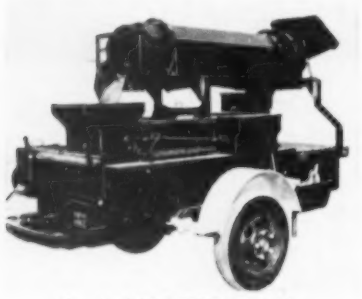
Available on prompt delivery to meet your macadam job requirements. See your Jackson distributor or if necessary write, or phone us direct.

JACKSON VIBRATORS INC.
LUDINGTON, MICHIGAN

WHAT'S NEW
in EQUIPMENT and MATERIALS

Plant Produces Hot Patch Material on Job

A new Model PM 215 Patchmobile, designed to produce accurately proportional hot patch material on the job, has been announced by Wylie Mfg. Co., Box 7066, Zone 12, Oklahoma City, Okla. The Patchmobile PM 215 features a rotary dryer, asphalt tank, pug-mill, power asphalt pump



New Model PM 215 Patchmobile

with spray attachment, volumetric asphalt measuring device, and asphalt tool-heating compartment, all in one packaged unit. It requires no other piece of equipment on the job, except a dump truck for towing (which can also be used to haul sand and gravel for the mix). No manual handling of aggregate and asphalt is necessary during the entire process of mixing the material in the PM 215 Patchmobile. The aggregate is shoveled from the dump truck into the charging chute of the rotary dryer. As the dryer rotates, the material is conveyed by means of flights through a blast of flame from the dryer burner to the discharge chute and into a batching hopper located directly above the pug-mill. As the hot, dry aggregate is released into the pug-mill, the correct proportion of hot asphalt from a volumetric measuring reservoir is discharged into the pug-mill through a spray bar. This eliminates handling of the hot asphalt by buckets or ladles. As the asphalt reservoir is emptied it is immediately refilled by a power-driven asphalt spray pump, which is standard equipment on the PM 215. The aggregate and asphalt is mixed and conveyed through the pug-mill to the discharge gate where the hot, mixed material is ready to be used.

New Lightweight Axle Assembly

The United Manufacturing Co., Bedford, O., has announced that a new lightweight axle assembly has been designed and approved under Government Spec. MIL-W-8005. This new unit can be furnished in United "Caravan" 2-wheel axle assemblies and 4-wheel automotive type steering assemblies mounted with approved parking brakes and spring assemblies. The 4-wheel unit consists of a 1¾ in. square front automotive type steering assembly and 1¾ in. square rear axle assembly. Hubs, wheels, 6.00 and 9 industrial tires conform to MIL-W-8005. Towing bar is equipped with 3 in. government eye to specifications. A number of current government cantracts call for the "Caravan" unit on hose reel units, cabinet leakage tester units, air compressors and general all-purpose trailers.

X-73 Ice Remover Contains Rust Inhibitor

An ice-removing chemical for use on steps, walks, drives, loading docks and parking lots is announced by The Monroe Company, Inc., 10703 Quebec Ave., Cleveland 66, Ohio.

Known as X-73 Ice Remover, the product is said to melt ice and thaw snow many times faster than salt; and to eliminate ice chipping and greatly reduce the need for snow shoveling. It is also claimed to contain a rust inhibitor which affords protection to automobiles, machinery, drains and gutters. It is especially recommended for furnishing quick traction under spinning automobile and truck wheels.

Concrete Saw Utilizes Hydraulic Control

A new Eveready concrete saw, announced by Eveready BrikSaw Co., Dept. 296, 1509 South Michigan Blvd., Chicago 5, Ill., has a hydraulic control for lowering the blade as a means of providing longer blade life. The operator can lower the blade gently into the cut at a controlled rate of speed—there is no danger of dropping or bouncing the blade against the material. With two or three short,

New Eveready Concrete Saw in Action

quick strokes of the hydraulic pump handle, the operator can lift the blade straight out of the cut with no twisting or binding. Other features claimed for the new Eveready concrete saw include: "Tri-Matic blade" alignment, an automatic "floating action" of the saw wheels that prevents any binding or tilting of the blade when saw is operated over uneven or broken surfaces; a dual blade shaft that makes it possible to place the blade at either side for sawing in corners or confined areas; a depth control lock that allows cutting to a pre-determined depth; a friction-type foot brake that holds the saw on hills or inclines; dash board controls that make possible every cutting operation by the operator from his place behind the saw.

New Heavy Duty Engine Easy to Start

A new heavy duty engine stated to be remarkable for its ease of starting, is now coming off the production line at The Lauson Co., New Holstein, Wis. The new engine has the Lauson's special air cooled design. Its dust and moisture proof outside magneto with impulse coupling insures easiest starting. Developing 3.70 H.P. at 1,800 R.P.M., the P-25 peaks at 6.30 H.P. at 3,600 R.P.M. Heavy-duty ball bearings at both ends of the counter balanced crank shaft give it a smooth flow of power. Both the crank shaft and the connecting rod are of heat treated drop forged steel. The replaceable steel backed connecting rod bearing liners are babbit lined. Its fly ball governor runs in oil. Power take-off pad drilling is optional as is the base mounting.

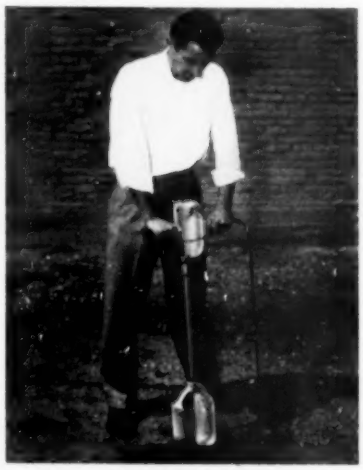
New Mobile 2-Way Radio Equipment

New mobile two-way radio communications equipment for use in the UHF (ultra-high frequency) band, which opens up uncrowded radio channels for public safety, transportation and industrial users, has been announced by the RCA Victor Division, Radio Corporation of America, Camden, N. J. The system employs the new RCA Type CMU-10A mobile transmitter-receiver in conjunction with any one of three available UHF base stations —the RCA Type CSU-20A, desk console, the RCA Type CSU-20ACR rack station, or the RCA Type CSU-100ACR rack station. The new equipment provides for use of as many as 80 new channels of communication in the 450 to 470-megacycle portion of the spectrum by such agencies as police and fire departments, industrial fleets, domestic public services and taxicab operators.

In many localities where existing VHF two-way radio facilities are heavily overtaxed, it is stated the new UHF radio units will make possible a major extension of mobile radio service.

Self Powered Portable Hole Digger

A new self powered portable hole digging and tunneling machine, introduced by Multi-Matic Corporation, P. O. Box 2143, Van Nuys, Calif., is stated to dig holes, at any angle, from 4 to 8 inches in diameter, up to 6 feet deep with a shaft extension. For pipe installations, it will tunnel up to 12 feet deep. The specially designed hardened alloy steel blades work with a pulverizing, grinding action and will not bend, break or throw the operator when obstructions are encountered. The tool chews up softer shale, rides above large rocks without damage. Operating in any remote location from a 1.25 KW (or more) AC or DC generator, the power unit is made by one of the most famous names in power tools. It can be used on a 115 Volt DC or AC (60 cycles or less) power source.



Super Hole-A-Matic

Traffic Signs Made from Aluminum Alloys

A new line of traffic signs manufactured from hard aluminum alloys and smooth-surface "Scotchlite" brand reflective sheeting has been announced by Minnesota Mining and Manufacturing Co., 900 Fauquier St., St. Paul 6, Minn. Advantages claimed for the signs are: The spring and temper of the aluminum resists and reduces the vandalism; the signs are rust proof and therefore need no painting; they are faced with a smooth-surfaced reflective material that is as easy to clean as washing a window. The "Scotchlite" brand reflective sheeting is stated to make the shape and color of the sign clearly visible at night over a quarter-mile away. The reflective sheeting is supplied in standard traffic colors which conform to the Uni-

Traffic Sign Made of Aluminum Alloy

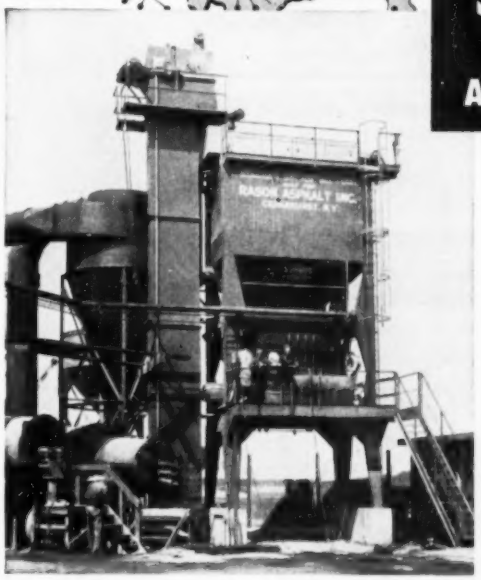
form Manual of Traffic Control Devices. The aluminum alloy used is 61S-T6 in an .081 gauge—the same alloy that is used extensively in building and marine construction. The new line includes 42 different traffic signs, ranging from regulatory to warning and guide signs.

Steam Cleaner Gives Full Working Pressure in 2 Min.

A new high-capacity steam cleaning machine, capable of discharging 150 gals. of balanced cleaning solution per hour, has been announced by the Clayton Manufacturing Co., Box 550, El Monte, Calif. New in design and development the Model LH Clayton Kerrick-Steam Cleaner is built to meet the need for low-cost equipment to handle a large volume of cleaning work with utmost speed and efficiency. The new unit is completely self-contained. It offers a graduated range of cleaning pressures extending from 30 p.s.i. for such jobs as paint stripping, to 100 p.s.i. for the rapid cleaning of heavily encrusted or grease-coated parts and surfaces. Its carefully designed heating coil, wound in a helical pattern, provides a guaranteed thermal efficiency of 75% minimum. Because full working pressure is attained in two minutes from a cold start, there is no need to keep the machine in operation on a standby basis.

Model IH Clayton Kerrick-Steam Cleaner

See why sales of the STANDARD RB ASPHALT PLANT have increased over 500% in one year!



Take a close look at the pattern of *Standard RB Asphalt Plant* installations. You'll notice when one RB plant starts operating in a locality, others soon follow. That explains why STANDARD sales have zoomed over 500% in a year. The word is passed from contractor to contractor—"HERE'S THE SWEETEST PERFORMING PLANT IN AMERICA—a bearcat for economy, ruggedness and high capacity."

But the best way to SEE the reason for the RB's popularity is to watch the plant in action. Balanced flow is the secret—assured by such features as extra-large dryer capacity and oversize elevators, vibrating screens and air handling systems. There are no stops—no bottlenecks. Write today for the address of the Standard Plant nearest you and—*SEE FOR YOURSELF.*

UNIT BUILT—8 SIZES, 500 to 6000 POUND BATCH CAPACITIES
FULL DESCRIPTIVE LITERATURE ON REQUEST

STANDARD

STANDARD STEEL CORPORATION

5003 BOYLE AVE., LOS ANGELES 58 • 7 EAST 42ND ST., NEW YORK 3

Fast, Low Cost Controlled Concrete Curing With

SERVICISED
CURING COMPOUNDS

- Provide lowest unit of moisture loss
- Each type meets official specifications
- "Stay put" on vertical surfaces—won't run leaving bare, untreated areas

4 TYPES:

1. PIGMENTED — Gray and white

2. CLEAR — Wax-resin base and resin base types.

3. SEPARATION (Anti-Bond) — For "Tilt-up" and Pre-Cast Concrete construction

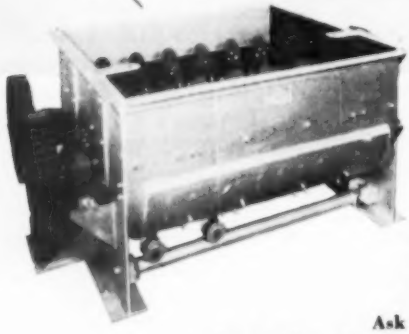
4. BLACK

Servicised Concrete Curing Compounds offer the contractor many time, material and labor saving features in controlled concrete curing. Write for the new, illustrated circular describing the complete line of Servicised Concrete Curing Compounds.

SERVICISED PRODUCTS CORP.
6051 W. 65th STREET • CHICAGO 38, ILLINOIS

"Deflates" Asphalt Mixing Costs!

IROQUOIS—IMPROVED EQUIPMENT



With today's high charges for labor and materials, Iroquois—Improved Equipment pays off investment . . . returns profit . . . faster than at any time in history. Let us make recommendations based on study of your operating conditions. No obligation.

Ask IROQUOIS About:
Larger Capacity Mixers • Simplified Drives • High Production Dryers with Automatic Temperature Control • Vibrating Screens • Controlled Aggregate Feeders • Complete Asphalt Plants.

*Iroquois Division**
POSEY IRON WORKS, INC.
*Established over 60 Years
LANCASTER, PA.—New York Office: Graybar Building

New Compact Mobile 2-Way Radio

Several mobile models have been added to the diversified line of 25-54 Mc. F.M. 2-way radio equipment of Motorola, Inc., 4545 Augusta Blvd., Chicago, Ill. These

New T41G Series 6/12 VDC 30 Watt Mobile Unit

new 30 and 60 watt models feature innovations such as universal 6-12 VDC operation, dual interrupter vibrator power supply and drastically reduced primary power drain. A newly developed extra long life all-vibrator power supply attains 70% power conversion efficiency compared to conventional 55% efficiencies which together with other power economies designed-in produces an overall drain reduction of almost 50%. When operating from a 6 volt battery, the new 60 watt model requires 10.5 amps on standby and only 43 amps during transmit periods which is the equivalent power requirement of conventional 30 watt equipment. Power drain of the new 30 watt unit is approximately equal to that of a conventional 10 watt transmitter-receiver combination. The new radio sets may be used interchangeably in 6 and 12 volt vehicles without revising internal wiring. All power conversion is accomplished automatically in the external cabling and connectors which are unique for 6 or 12 volt operation.

Welding Rod Has High Resistance to Abrasion

A new hard surface gas welding rod with high resistance to sand and earth abrasion has been developed by Marquette Manufacturing Co., of Minneapolis, Minn. Called the No. 10 Gas Hard-Rod, it is particularly designed for use with sand and gravel equipment, mining and earth-moving machinery because it builds up parts subject to severe wear and abrasion but low impact.

New Bolster Bushing Set for International Tractors

A complete set of tools for removing and installing the upper and lower Bolster Bushings on Models "H" and "M" International tractors has been added to the line of special tractor tools put out by Owatonna Tool Co., 435 N. Cedar St.,

Owatonna Tool Co.'s Set No. HC-30A

Owatonna, Minn. This set (No. HC-30A) contains five sizes of bushing driver collars with a suitable driving mandrel to fit, and operates on bushings 43805-DR, 49658-DAR on the H Model, bushings 45172-DR, 49661-DAR on the Model M and bushing No. 41096-BR which is common to both models.

Crusher Type and Uses

A new booklet giving information on how to go about making the most efficient and satisfactory application of various types of crushers to specific jobs has been published by the Pennsylvania Crusher Company, 1773 Liberty Trust Building, Philadelphia 7, Pa. All the important factors that go to influence operation, such as power consumption, parts wear, maintenance costs, uniformity of product and others are discussed in detail. Also, a check list is given to help determine the best type of crusher for various jobs. Five types of hammermills, jaws, impactors, granulators, gyracones, Bradmills, Bradford Breakers, Bradford Hammermills and several types of single rolls are discussed in detail.

Seven New Models Added to I-H Power Unit Line

Seven new 6-cylinder models have been added to the gas-gasoline power unit line of International Harvester Co., 180 North Michigan Ave., Chicago 1, Ill. The line now includes 12 engines ranging from 16.5 to 200 net maximum horsepower. New valve-in head power units and their horsepower ratings follow: U-1091 (natural gas), 180 net hp @ 1,375 rpm or up to 200 net hp @ 1,600 rpm on factory-approved applications; U-450, 102 net hp @ 1,800 rpm; U-406, 91 net hp @ 1,800 rpm; U-372, 83 net hp @ 1,800 rpm; U-269, 62 net hp @ 1,800 rpm; U-240, 55 net hp @ 1,800 rpm; and the U-220, 50.5 net hp @ 1,800 rpm. Basically, the new U-1091 power unit and the International UD-24 diesel power unit have many common components. Principal differences are a different cylinder head and elimination of the fuel injection system. The new model is also equipped with lower compression pistons, a large updraft carburetor, magneto, spark plugs, and a gear-driven, variable-speed governor. The six other new models are power units which have International truck engines.

New Power Control Unit Described

A 4-page folder illustrating and describing the new Baker Power Control Unit, PCU-75, has been released by The Baker Manufacturing Co., Springfield, Ill. Performance details are given on the completely new design features of the PCU-75's multiple-disc clutch, simplified brakes, adjustable hand levers, and sheave mountings. Full specifications are also given.

Schield Bantam C-35 Unit

Schield Bantam Co., of Waverly, Iowa, has issued an attractive folder showing details of its new Model C-35 5-ton, ¾ cu. yd. crawler crane excavator. Specifications are a major feature.

WHITE ASPHALT PLANTS FOR HOT-MIX PAVING

These reasonably-priced stationary hot plants are complete on one steel frame, for easy moving to a new location. Excellent for medium-size city paving jobs, for street and highway maintenance, and for paving driveways, alleys, sidewalks or industrial plant areas.

Oil-fired rotary dryer, batch mixer, vibrating screen, divided hot bin, dust collector, volumetric or weigh scales, engine or electric power, air controls.

Model L-12, 12-15 tons per hour; Model L-25, 25-30 tons per hour. Portable units also available

For FREE circular, write—

Elkhart 20 White Mfg. Co. Indiana

...designed to give you the fastest CHARGE—MIX—DISCHARGE CYCLE

The key to MADSEN'S fast charging, mixing and discharging in the new Model 481 Plant is: (1) MADSEN'S 6-second asphalt pressure injection, (2) the new MADSEN Model 440 Twin-Shaft Pug Mill, and (3) the high-speed convenient controls which operate the air valves which open and close the various gates and control the pressure injection. No other batch type asphalt plant gives you such fast action where speed pays off in greater production and greater profits!

If you are in the market for an asphalt plant . . . you owe it to yourself to check all the superior features MADSEN offers in the new Model 481 Plant.

Established 1910...The oldest manufacturer of asphalt paving plants in the West.

MADSEN IRON WORKS, INC.
P. O. BOX 589 • HUNTINGTON PARK, CALIF.

Write for your copy of Catalog No. 800.

Heat Tampers and Smoothers in HAUCK Asphalt Paving Tool Heaters

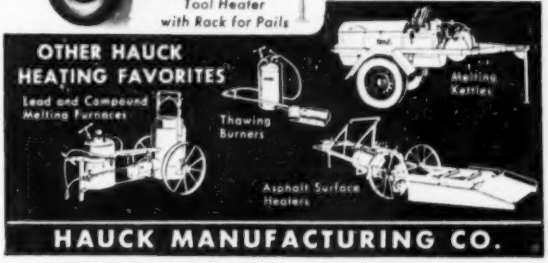
Combination Asphalt Paving Tool and Cement Heater

Heat 16 or More Tools in 5 Minutes

Hauck Heaters get your asphalt tools ready as you need them. Burn kerosene; can also be furnished to burn L.P. gas. No sparks, no smoke, no ashes. Only safe, controlled heat. Available with built-in binder cement kettle or with rack for binder pails.

Asphalt Paving Tool Heater with Rack for Pails

Write for Catalog



HAUCK MANUFACTURING CO.
119-129 Tenth Street • Brooklyn 15, N. Y.

Treating asphalt with

DARAKOTE permits wider use of local aggregates

DARAKOTE actually displaces water—even on wet, hard-to-coat aggregates. It stretches your paving *dollar* because it enables you to make wider use of cheap, plentiful local aggregates and still meet anti-stripping specifications. It stretches your paving *season* because it enables road crews to work earlier in Spring . . . later this Fall.

For mixed-in-place construction, windrows processed with DARAKOTE-treated liquid asphalt or road oils require about half the time to dry down to optimum moisture content.

Use DARAKOTE with asphalt cements, cut-back asphalts, road tars and road oils. It pours readily and disperses quickly in bituminous materials at all working temperatures. It prevents stripping both during and after construction.

DARAKOTE is available in ready-to-use form for use in the field or in concentrated form for refinery use!

WRITE FOR FREE BROCHURE TODAY!—

DEWEY and ALMY Chemical Company

Cambridge 40, Mass. • Chicago 38
San Leandro, Calif. • Montreal 32

CONSTRUCTION SPECIALTIES DIVISION

Photo courtesy Baldwin-Lima-Hamilton Corp., Lima, Ohio

FOR SALE or RENT

1—L. P. Tourneau Pan—New.

1—Bucket Belt Conveyor — 47 feet long, 18 inches wide—New.

1—Wooldridge Scraper — 8 to 10 yard Model BBM.

1—Austin Jaw Crusher—10x40.

1—Center Feed Gruendler Pulverizer—3XB.

1—Hartzog Horizontal Drill—Model F-11 with bits.

MEYERS & GREENE

BOX 191 PHONE 756

HAZARD, KENTUCKY

FOR SALE

Dixie Mill with Revolving Breaker & Speed Reducer.

12-Ton Huber, 3-Wheel Power Roller, Ser. #T4481, powered by Caterpillar D-4400 Engine, Ser. #1S-3819-SP.

Model 303 Koehring Shovel Front with Bucket.

LS-85 Shovel Front.

2—Cleveland Wagon Drills, Model-D14.

LeTourneau Dozer, Model-C, Ser. #LD2046-C2, powered by 6DC844 Buda Engine, Ser. #38837 (needs some repair).

Northwest Crane—Model 105 w/ Clamshell Bucket, powered by 6SRK Waukesha Motor, Serial #336.

Page Drag Bucket—2½-yard.

100' Bucyrus-Erie Boom & Fairleads & High Gantry Frame for Model 54-B.

GMC Twin Generator Set, Motor Model #671LA247, Ser. #67154148, Western Electric Generator, #302-401, volts 440, amps 149, KW149, 600 RPM.

CONCRETE MATERIALS & CONST. CO.

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Model 140, Continental Engine, 30" Cut.

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Wisconsin Engine, Pneu. Tires.

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One Barber-Greene Standard Model 82-A bucket loader complete with swivel spout, 10" x 8' 5" crawlers, high reverse speed, notched spirals, 42½ H.P. six-cyl. Buda gasoline engine, oil filters, self-starter and 25 gal. gasoline tank. This machine is in excellent condition, ready to work. Available immediately, subject to prior sale. Now located at Parkersburg, W. Va. Price: $5,500.00.

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1—2 Cu. Yd. Rex H.D. Mixer on Dodge Truck—1947
2—2 Cu. Yd. Jaeger H.D. Mixers—1946

These mixers are in operation, mechanically O.K.; are being replaced with larger equipment.

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2 Diesel Welders—200 & 400 Amp.—Chicago Pneumatic Air Tools & Parts—Rock Bits and Steels—Tool Steel—Pumps — Rope Accessories—Welding Supplies—Hard Surfacing Rod—Slugging & Striking Wrenches — Twist Drills — Hoists — Jacks — Lubricating Supplies — Electric Motors — Fuses — Insulators — V-Belts — Packing — Fire Extinguishers.

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1—70 ton 4 compartment Lippert aggregate bin w/20,000 lb. 4 Beam Thurman batcher hopper.

1—200 Bbl. Lippert bulk cement storage bin w/2,000 lb. cement weighing hopper.

2—L 182 International trucks w/3 cu. yd. Jaeger mixers mounted on them.

This equipment bought new in fall of 1951 and has worked only on Section II, Part II, New Albany Floodwall Project.

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Highest dollar value paid for new and used trucks and all kinds of used equipment. All types of truck equipment bought and sold, including war surplus. Write, phone or wire:

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A-C Model HD-14 Tractor, completely rebuilt and guaranteed, with cable angledozer, very reasonable.

A-C Model HD-10W Tractor, completely rebuilt and guaranteed, with LeTourneau Double Drum Cable Control Unit, low price.

A-C Model HD-5G Endloader, rebuilt and guaranteed.

A-C Model AD-3 Motor Patrol, rebuilt and guaranteed.

Caterpillar Model D-4 Tractor, used very little, cheap.

Caterpillar D-4 with new style Traxcavator Endloader, late model, in excellent condition, cheap.

Caterpillar Model 112 Motor Patrol, fair condition.

LeTourneau Model YR Scraper, clean, very low price.

LeTourneau Super C Tournapull, eight to choose from, reasonable.

Buckeye Model 402 Ditcher, rebuilt, fair price.

International TD-14A Tractor with Hough Endloader, 2 cy. bucket, good condition, less than half the price of new.

Northwest Model 18 Dragline, rebuilt and guaranteed, a bargain.

A-C Model B Wheel Tractor, rebuilt and guaranteed, with new mowing attachment, low price.

Sullivan 210 Air Compressor, fair condition, reasonably priced.

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Euclid Trucks 15 Ton—22 Ton End Dump—15 Yd. and 25 Yd. Bottom Dumps—12—25 Yd. Bot.-Dump without tractors.

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Jaw Crushers 36" x 48" Nordberg—36" x 48" Farrel —60" x 48"—42" x 40"—42" x 30"—24" x 36"—18" x 36"—15" x 36" Symons Cone 5½'—4'—3'—2'—50 x 40 Dixie hammer mill—54" Traylor Type T—42" McCully—48" Gyrosphere.

Shovels—Roll Crushers—Rod Mills—Ball Mills—Rotary Kilns—Dryers—Log Washers—Classifiers—Mine Hoists—Transformers—Motors—Gravel Plants—Blast Hole Drills—27T—20T—42T—Generator sets—Drag Lines. 2—25' A.C. Log Washers.

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Theatre Bldg. Tel. 580 Crosby, Minnesota

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ALLIS-CHALMERS HD-14—Hydraulic Bulldozer Blade. Machine completely reconditioned $5,500.00

QUICKWAY Model E, ½ Yard on Coleman 4-Wheel Drive Truck. Factory mounted unit. 30 Foot Boom. Drag Bucket. All Reconditioned $6,500.00

POWERHORSE 40—4-Wheel Drive Industrial Tractor. ¾ Yard Front End Hydraulic Loader. Bulldozer Blade. Used only 200 hours $2,700.00

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HYSTER D-6 Hystaway Drag and Clam Combination Attachment. Like New. Priced to sell.

NEW AMERICAN Vacuum Leaf Loader $1,200.00

All equipment stored in our yard and immediately available. First come, first served.

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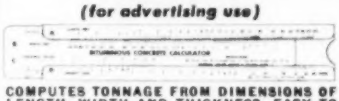
SAULT STE. MARIE, MICHIGAN

BITUMINOUS CONCRETE CALCULATOR

(for advertising use)



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SAMPLE $1.00 REFUNDED ON YOUR FIRST ORDER. NO CHARGE FOR SAMPLES TO BITUMINOUS CONCRETE MANUFACTURERS WHO REQUEST IT ON THEIR LETTERHEAD.

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GOOD USED CONSTRUCTION EQUIPMENT

HD-14 Allis-Chalmers w/Baker hyd. dozer, engine and clutches just overhauled, machine repainted and in excellent condition.

HD-5G Allis-Chalmers Tracto Shovel, engine overhauled, new tracks, rollers and sprockets, completely rebuilt and guaranteed.

HD-7W Allis-Chalmers Tractor with cable angledozer and rear mounted winch.

HD-10W Allis-Chalmers Tractor with hyd. dozer, engine clutches and final drives just overhauled. Machine in A-1 condition.

TD-9 International w/Isaacson hyd. dozer and rear mounted winch—machine in good condition.

TD-9 International w/hyd. loader—machine like new (only 1400 hours).

D-4 Caterpillar w/Cable loader, new tracks and rollers—machine in very good condition.

D-6 Caterpillar w/1½ yard cable loader 9V series.

D-7 Caterpillar Tractor w/double drum power unit—like new condition (used only 110 hours) priced right.

Foote Single Drum 34-E Concrete Paver w/Hercules Gas Engine.

Adnun Black Top Asphalt Paver, Hercules gas engine, electric screed heater and extensions, rebuilt and in excellent condition.

Barber-Greene Model 705 Utility Trencher, rubber tired, digging depth 4½', cutting width 10½". Factory demonstrator and in A-1 condition—priced right.

Buckeye Model 402 Utility Ditcher, factory demonstrator in like new condition, digging depth 4', cutting width 10".

10-B Bucyrus-Erie combination clamshell and lifting crane with like new front shovel attachment, 28' boom and 5' extension, gas engine power.

Model 25 Bay City ½ yard Back Hoe, Caterpillar engine, machine in good condition.

Model 204 Koehring self-propelled Cruiser Crane, combination dragline, clamshell and lifting with 55' boom and jib—very good condition.

Lorain Model 75-B, 1¼ yard dragline, 50' boom, caterpillar D-1300 engine—machine in excellent condition.

Cedarapids Stationary Gravel Plant, complete with Model 2020 Impeller Crusher, hopper, grizzly, conveyors, and washing plant, electric powered. Plant used less than 3 months and like new.

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Rebuilt—A1 Condition

1 Model 6 N.W. Shovel, diesel
1 Caterpillar D8 Bulldozer
1 Apsco Stone Paver, Model P120
1 New Shovel Front for Model 6 N.W.
1 Used Shovel Front for Model 25 N.W.

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Middle River, Md. Phone: Essex 1310

BARGAIN

SHOVEL, ¾ Yd. BUCKEYE Model 70

New 1947 ⁘ Gasoline Engine

Price $6,000.00

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Road Construction Engineers

Northern Manufacturer of Road Building Machinery wants a Road Construction Engineer desirous to enter Sales field. One acquainted with road building machinery to act as representative in the South, supervising Distributors activities of the Manufacturer, calling with distributor or salesmen on officials of states, municipalities and private clientele in the Southern states. He would have to work from his home as his headquarters. Salary, commission and travel expenses provided for.

If interested, give age, salary expected, present status and furnish references with resume of past activities.

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ADAMS 312 Motor Grader
ALLIS-CHALMERS AD Motor Grader
BARBER-GREENE 82A & 543 Bucket Loaders
BROWNING T15 17½ Ton Motor Crane
BUCYRUS-ERIE 10B Crawler Shovel-Hoe
BUCYRUS-ERIE 591 & B170 Scrapers
CASE DI Tractor & ⅜ yd. Lull Loader
CAT. D-2, R-2, D-4, R-5, D-6, D-7, D-8 Tractors
CAT. D-4 & 1 yd. hyd. Traxcavator
CLETRAC BG & HG Tractors
HEBARD J233 Wheel Tractor
HOUGH HAH, HE & HF Payloaders
INT. TD-6, TD-9, TD-14A, TD-18A, TD-24 Tractors
INT. TD-9 & 1 yd. hyd. B-E Dozer Shovel
LORAIN 75A, 80, 820 Shovel-Hoe-Crane
P & H 455A 1 yd. Crawler Crane
P & H 150TC 12½ Ton Motor Crane
QUICKWAY E 4/10 yd. Motor Shovel
SCOOPMOBILE
TROJAN Motor Grader

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MICHIGAN TRUCK SHOVEL & CRANE

T6D ⅜ Yd. Shovel
30-Ft. Crane Boom
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GUARANTEED AIR TOOL SPECIALS

Chicago Pneumatic Drills, No. 327, 425 rpm., No. 3 Taper, Drill 1¼", Ream 1", Cost Approx. $285. Our price $75.
Ingersoll-Rand Drills, No. 3K4, No. 3 & 4 Taper, Drill 1¼", Ream 1", 300 rpm. Cost Approx. $285. Our price $75.
Chicago Pneumatic Riveting Hammers, No. 60, Capacity Hot Rivets ⅞", 6" Stroke. Cost Approx. $185. Our price $65.
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NEW C.P. Boyer Rivet Sets for 40, 50, 60, 80, and 11 Riveting Hammers, Cost $3.85. Our price $1.50 each in lots of 12.

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315' CHICAGO PNEUMATIC Diesel Compressor
Worked 800 Hours
MOUNTED ON
FEDERAL 4-Wheel Drive Truck
With
G200R Chicago Pneumatic Wagon Drill
w/ 70N Drifter
Used 800 Hours

All new in 1950. All Excellent Condition.
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Unless you send this information direct to us we can't be sure. Sometimes a reader's name is cut from the mailing list because we are not sure that our information as to name, title and address is right. *Your* name might be cut from the mailing list.

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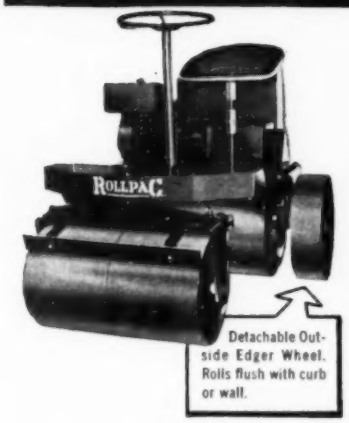
Signature

SOIL-AIRE
ROLLPAC
Ruggedly built for heavy-duty service



Detachable Outside Edger Wheel. Rolls flush with curb or wall.

A Standout Popular-Priced One Ton Roller. Send for Catalog.

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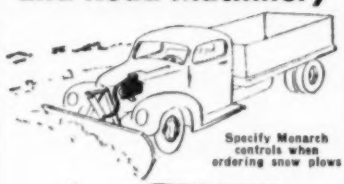
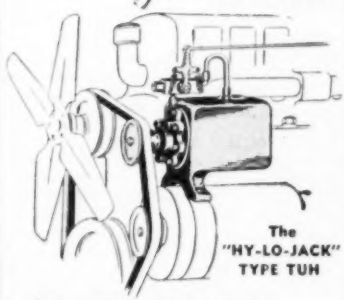
Sold by over 75 distributors in United States and Canada

POWER
HYDRAULICS
for Snow Plows
and Road Machinery



Specify Monarch controls when ordering snow plows



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- Clutch operated (Optional)
- Thousands in use
- Fan Belt or Electrically Driven
- Fit All Trucks

WRITE HYDRAULIC DIVISION
MONARCH ROAD MACH. CO.
322 North Front Ave.
GRAND RAPIDS 4, MICHIGAN

WITH THE MANUFACTURERS & DISTRIBUTORS

Melvin Staben's appointment as district manager of the Northwest district for the Findlay division of Gar Wood Industries has been announced by R. J. Jay, Findlay Division sales manager. Mr. Staben is well known in the Pacific Northwest, where he has covered the logging and construction industries for the past twenty years. In his new position he will cover the states of Washington, Oregon, Montana, Idaho and Wyoming. Temporarily, he will also cover Utah, California, Arizona and Nevada in conjunction with A. M. Guthrie, Findlay Division West Coast district manager.

Phil Scott Takes Partnership in New Masonry Saw and Blade Company. G. P. Scott who for the past five years has headed the Eveready Briksaw Co. of Chicago has resigned to become a full partner in the Robert G. Evans Co., 6315 Brookside Plaza, Kansas City, Mo. The new company, which commenced operations during 1952, will manufacture a full line of masonry saws, concrete saws, diamond blades, abrasive blades, and reinforced safety-blades. All products are marketed under the tradename "TARGET." Exclusive distributor franchises are being established throughout the United States and Canada.

O K Clutch Changes Ownership. O K Clutch & Machinery Co., Columbia, Pa., founded in 1903, has been purchased by John C. Motter Printing Press Co. and the manufacture and sales of O K line of compressors, hoists and portable elevators will be carried on through the O K Machinery Division of the new company. **James L. Ealy, Sr.,** will be general manager of the O K Division and he will be assisted by Charles H. Druschel, who has been associated with O K since 1927.

Soil Testing Services, Inc., has announced the opening of its new offices and testing laboratory at 3529 North Cicero Ave., Chicago 41, Ill. Activities of the firm are directed by John G. Gnaedinger, president and Carl A. Metz, vice president. Other sales offices of the company are located at 1844 North 35th St., Milwaukee, Wis. and 1105 East James St., Portland, Mich.

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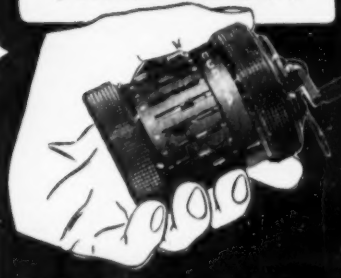
PRESTIGE
hotel
PARK LANE

Overlooking beautiful Lake Michigan—a few minutes to the loop. Rooms and suites . . . excellent cuisine.

Sheridan Road at Surf Street
CHICAGO

SLIDE RULE PORTABILITY!
CALCULATOR ACCURACY!



CURTA Calculating Machines--lowest priced complete calculators on the market.

Field Work — distance and weight figures

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Inventory — totals wherever you go

In a special shock-proof case, the Curta model II calculator weighs but 12 oz. Fits easily in brief-case, desk drawer, jacket pocket, or glove compartment.

Life-time anodized finish, engraved dials, arctic and tropic-proof all-metal construction.

FULLY GUARANTEED
for complete descriptive Literature, or 10 DAY FREE TRIAL

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CURTA Calculator Co.
3851 W. Madison Street
Chicago 24, Illinois

"MEALORUB"

CRUDE NATURAL RUBBER IN CRUMBS

The only natural rubber powder that has proven its value in asphalt roads in use for about fifteen years.

AVAILABLE FOR IMMEDIATE DELIVERY

For further information apply

JACOBUS F. FRANK

120 Wall Street **New York 5, N. Y.**

Representative for Indonesian Government Estates and The Indonesian Institute for Rubber Research

New Hensley Equipment Dealers. Hensley Equipment Co., Oakland, Calif., has appointed the following equipment stores exclusive dealers in their area: Loggers & Mill Supply, Arcata, Calif.; Lowry Equipment Company, Redding, Calif.; Fowler Engineering Sales, Ashland, Ore.; Western Equipment Co., Eugene and Portland, Ore.; Elko Blacksmith Shop, Elko, Nev.; S & M Supply Company, Grand Junction, Colo.; Gossman Scraper Works, Monte Vista, Colo.; Joe Smith Machinery Co., Denver, Colo.

Sales Territories Reorganized. Le Tourneau-Westinghouse Co., Peoria, Ill., has reorganized its domestic sales territories in 8 eastern and western divisions instead of eastern, central and western as heretofore. J. A. Vincent continues as eastern division sales manager, and F. W. Duke, former district sales representative, has been appointed western division sales manager.

Turner Named District Representative. Iowa Manufacturing Co., Cedar Rapids, Ia., has appointed Kenneth V. Turner district representative with headquarters in Dallas, Tex. His territory covers the states of Texas, New Mexico, Oklahoma, Arkansas and Louisiana.

Wheeley Promoted by Koppers. B. Otto Wheeley, heretofore assistant district manager, Birmingham, Ala., has been promoted to southern district sales manager for Tar Products Division of Koppers Co., Inc., Pittsburgh, Pa. He succeeds F. G. Owen, who died June 21.

Ingram Promoted by Airco. H. L. Ingram, Jr., Airco's special representative, Washington, D. C., has been appointed manager of the technical development department of Air Reduction Sales Co., New York, N. Y.

Caterpillar Establishes New Division. Creation of the Engine Division, a new major component of the company, has been announced by L. B. Neumiller, president of Caterpillar Tractor Co., Peoria, Ill. Coincidental with this move was the announcement by G. E. Spain, vice president, of a realignment of sales and advertising activities. The new division will be managed by H. H. Howard, formerly director of domestic sales. Mr. Spain announced establishment of the Sales Promotion Department with W. K. Cox, now advertising manager, as manager of the new department. The Sales Training Division, the Sales Development Division and the Advertising Department are to become the three divisions of this new department. Named to succeed Howard was W. S. Zeigler, now assistant director of Domestic Sales, who will manage the Domestic Sales Department.

Distributors for True-Lay Paver. Doyle L. Hallum, president of the Doug-Lynn Co., Inc., Walnut Creek, Calif., has announced the appointment of four distributors in the west for the True-Lay paver. Edward R. Bacon Co., San Francisco, Calif., Western Machinery Co., Phoenix, Ariz., Smith-Booth-Usher Co., Los Angeles, Calif., and Western Machinery Co., Spokane, Wash.

New Marion Shovel Distributor. Kern-Limerick, 115 North Spring St., Little Rock, Ark., has been appointed distributor by Marion Power Shovel Co., Marion, Ohio, for the entire state of Arkansas with the exception of a few northeastern and northwestern counties.

New Distributor for Le Tourneau. Atlantic Tug & Equipment Co., 1801 East Erie Blvd., Syracuse, N. Y., has been appointed distributor for northeastern New York state for Le Tourneau-Westinghouse Co., Peria, Ill.

Joseph Schofield now Gar Wood Controller. Joseph J. Schofield has been appointed Corporate Controller of Gar Wood Industries, Wayne, Michigan, according to a recent announcement by J. W. Considine, Secretary-Treasurer.

Koppers Comany, Inc. Makes Two Promotions. The Tar Products Division of Koppers Company, Inc., announced in August that Earl F. Bennett, former Manager of the Road Materials Section, was appointed Manager of the Road and Building Materials Section, and Dr. J. N. Roche, formerly Technical Assistant to the Division Sales Manager, was named Manager of the Sales Development Section.

Hal Row to Manage Sales Promotion for Heil. W. A. "Mike" Carlson, Sales Manager of the Body and Hoist Division, The Heil Co., Milwaukee, Wis., has appointed H. J. Row as Sales Promotion Manager of his department. Row will act as coordinator on promotional matters between the Body and Hoist Division and Heil distributors around the country.

Wiggers Joins Ad Agency. Raymond P. Wiggers, formerly advertising manager of the Frank G. Hough Co., has joined the staff of Glenn-Jordan-Stoetzel, Inc., Chicago, Ill., as vice president and account executive.

New Baker-Lull Distributor. Ryan Equipment Co., 3350 Morganford Road, St. Louis, Mo., has been appointed distributor for shoveloader and sweepers for eastern Missouri and southern Illinois for Baker-Lull Corp., Minneapolis, Minn.

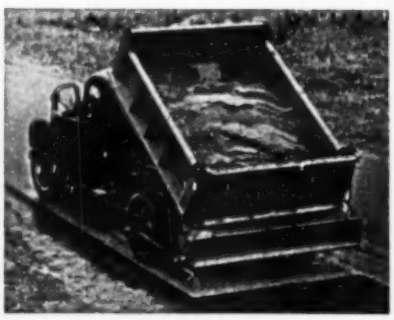
New Bucyrus-Erie Distributor. Graze-Dempsey, Inc., 1102 Edgewood Ave., Jacksonville, Fla., has been appointed distributor by Bucyrus-Erie Co., South Milwaukee, Wis., for 26 counties in northern Florida.

Do your sealcoating and ice control jobs the fast easy Swenson way. Spreads salt, chloride, sand, rock chips, gravel or cinders any width or amount desired.

Free Information

Swenson Spreader & Mfg. Co.

Lindenwood, Illinois



MECHANICAL ENGINEER

The services of a top flight mechanical engineer with practical experience are permanently required by a large and progressive organization in Canada. The man we are looking for should be familiar with all types of roadbuilding and commercial stone quarrying machinery and equipment, and have a working knowledge of the operations of quarries, asphalt and ready-mix concrete plants. It is suggested that only those with practical experience in similar fields reply to this advertisement. Give age, details of experience, references and state salary expected. All replies will be treated in strict confidence.

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Maximum Joint Filling

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- Recovers 50% Beyond Original Thickness After Compression
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Write for Catalog and Complete details on Servicised Joint Fillers and Sealers.

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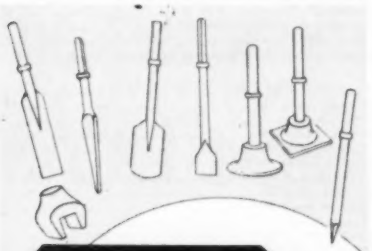

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Quality

PNEUMATIC TOOLS and CONTRACTORS' SUPPLIES

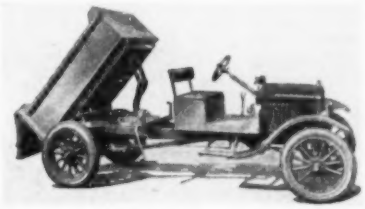
Write for Our Catalog

BICKNELL MANUFACTURING CO.

ROCKLAND, MAINE

Marion Metal Products Company of Marion, Ohio, manufacturer of dump bodies and hoists, is celebrating its 30th Anniversary in the dump body field. Its colorful history was traced in a recent issue of its new magazine publication, "Dump Body Business." The article recalled the not-too-distant days of hand hoists, gravity hoists, and early power hoists of the twenties.

The company started in 1923 with a few thousand dollars capital, 20 employees, a few machine tools, a Lincoln welder, and 5,000 sq. ft. of floor space in a cement



Contrasting to 1-1½ ton dump trucks of early 20's is this Marion 16 yd. trailer with twin-telescopic hoist—one of many body and hoist models Marion offers today.

block building. Today Marion Metal produces millions of dollars of equipment annually, has 320 employees, modern machine tools and equipment including a new machine shop, and 160,000 sq. ft. of floor space.

Le Roi Forms New Division. A new division to manufacture front end loaders and truck mounted mixers has been formed by Le Roi Co., Milwaukee, Wis. N. M. Sedgwick, formerly sales manager for Le Roi's construction and mining division, will be general manager of the new division which will be known as the Le Roi-Transo Division. W. G. Lunt, formerly assistant to the general sales manager, construction and mining division, will be assistant general manager of Le Roi-Transo.

Establishes New York Sales Office. Southwest Welding & Manufacturing Co., Alhambra, Calif., has established a sales office at 11 West 42nd St., New York, N. Y. W. F. Hefferman has been appointed the district sales manager.

Want a HOME?

For good living near the job, Schult offers BIG VALUE. For information, write now. Dept. 6609.

SCHULT CORP.

ELKHART, INDIANA

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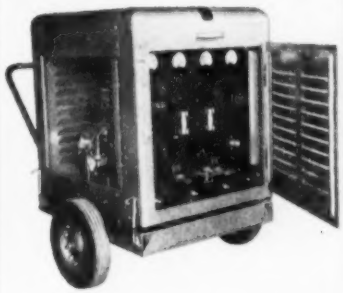

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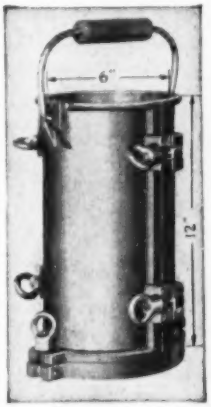

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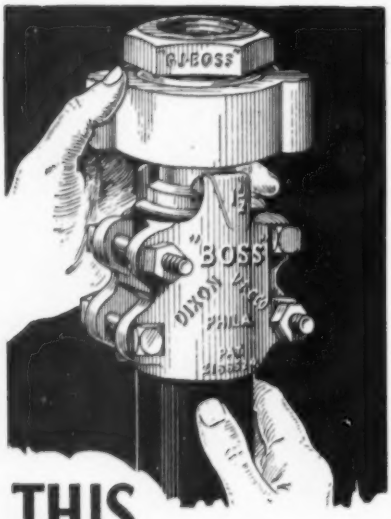

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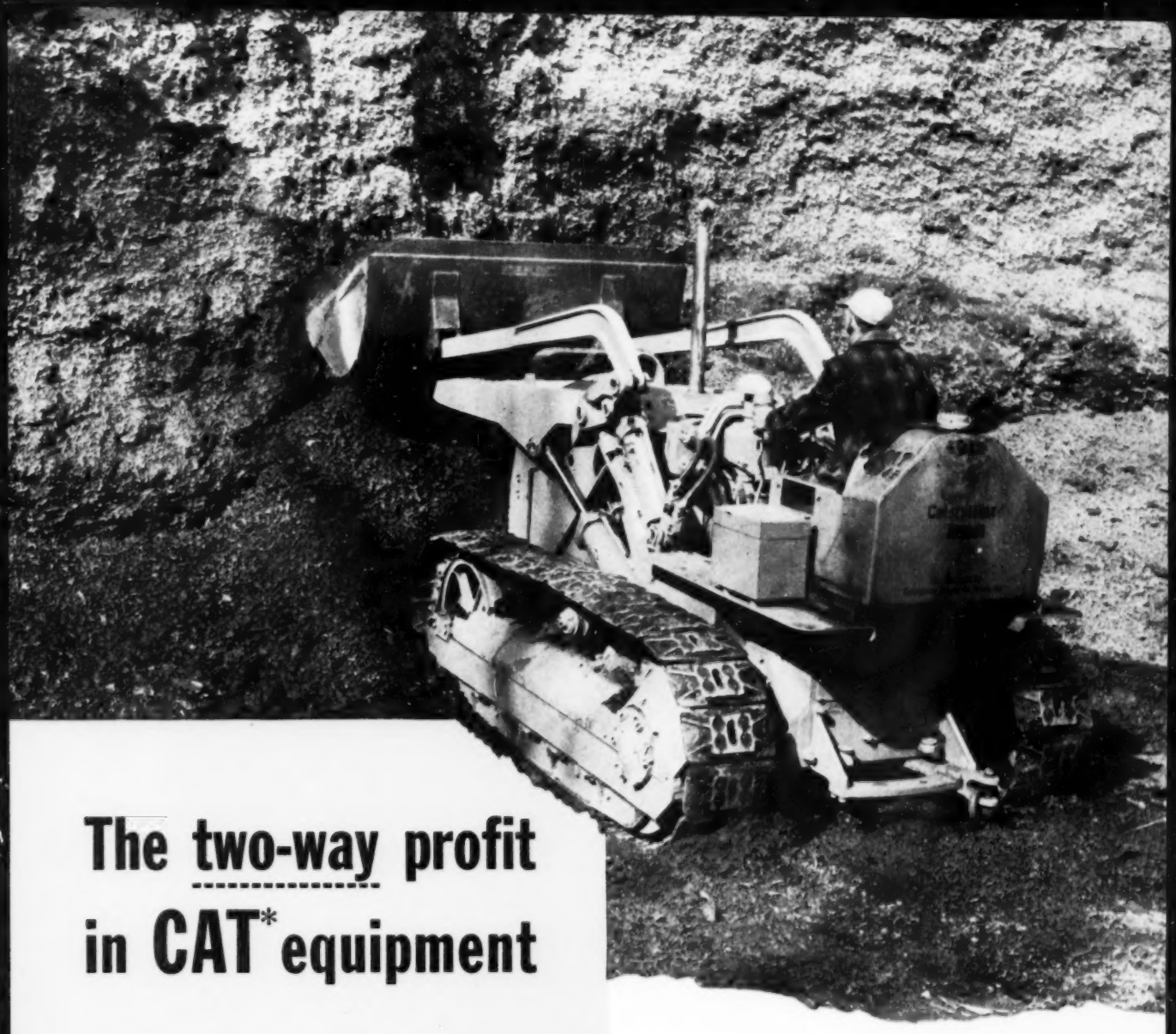

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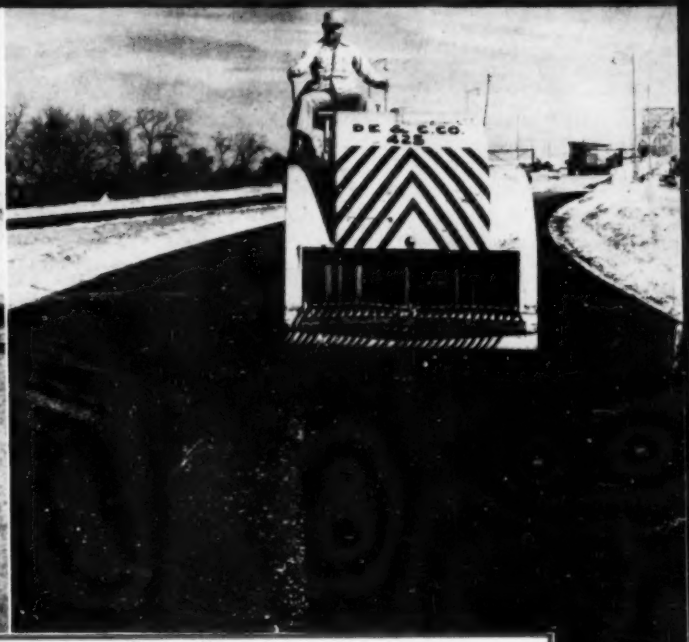

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